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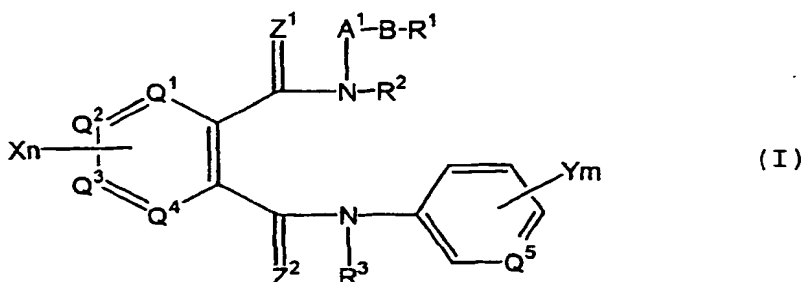
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(54) AROMATIC DIAMIDE DERIVATIVES, CHEMICALS FOR AGRICULTURAL OR
HORTICULTURAL USE AND USAGE THEREOF

(57) The present invention relates to an aromatic diamide derivative represented by the general formula (I):



[A¹ is optionally substituted (C₁-C₈)alkylene group, (C₃-C₈)alkenylene group or the like, B is -O- or -N(R⁴)- (wherein R⁴ is H, (C₁-C₆)alkyl, halo(C₁-C₆)alkyl or the like), R¹ is H, (C₁-C₆)alkyl, optionally substituted phenyl, optionally substituted heterocyclic group, or the like, R² and R³ are each H, (C₃-C₆)cyclo-alkyl or -A²-R⁸ (A² is -C(=O)-, -C(=S)- or -C(=NR⁹)-, R⁸ and R⁹ are each H, (C₁-C₆)alkyl or the like), Q¹ to Q⁵ are each carbon or nitrogen, X and Y are each halogen, cyano, nitro, (C₃-C₆)cycloalkyl, optionally substituted phenyl, optionally substituted heterocyclic group, or the like, n is 0 to 4, m is 1 to 5, and Z¹ and Z² are each O or S] or a salt thereof, an agricultural and horticultural chemical, and a usage of the chemical. The agricultural and horticultural chemicals of the present invention exhibit remarkable controlling effects against various insect pests such as agricultural, forest and horticultural insect pests, and stored grain insect pests, etc., which injure paddy rice, fruit trees, vegetables, other crop plants, flowers and ornamental plants, and the like.

Description

TECHNICAL FIELD

5 [0001] The present invention relates to aromatic diamide derivatives or salts thereof; an agricultural and horticultural chemical, in particular, an agricultural and horticultural insecticide, which contains said compound as an active ingredient; and a usage of the chemical.

BACKGROUND ART

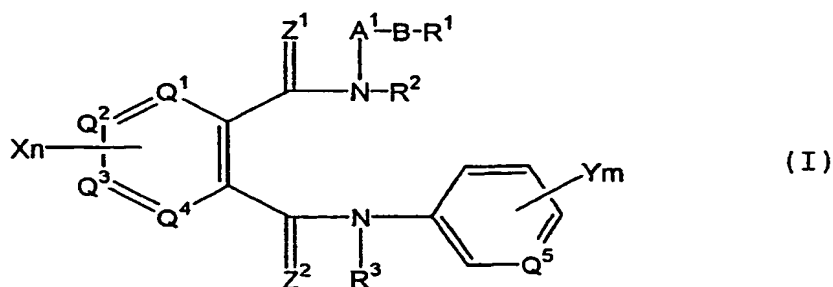
10 [0002] JP-A-11-240857 discloses a compound analogous to the aromatic diamide derivative of the present invention but does not describes working examples, physical properties and the like with respect to the compound of the present invention.

DISCLOSURE OF THE INVENTION

[0003] The production of agricultural and horticultural crops and the like is still badly damaged by insect pests and the like, and the development of a novel agricultural and horticultural chemical, in particular, agricultural and horticultural insecticide is desired because of, for example, the appearance of insect pests resistant to existing chemicals. In addition, because of the increased population of aged farmers, and the like, various labor-saving application methods are desired and the development of an agricultural and horticultural chemical having properties suitable for the application methods is desired.

[0004] The present inventors earnestly investigated in order to develop a novel agricultural and horticultural chemical, and consequently found that the aromatic diamide derivative represented by the general formula (I) of the present invention is a novel compound not known in any literature, and the present inventors found a novel use of said derivative as an agricultural and horticultural chemical, in particular, an agricultural and horticultural insecticide and their effective usage, whereby the present invention has been accomplished.

[0005] That is, the present invention relates to an aromatic diamide derivative represented by the general formula (I):



{wherein A¹ is a (C₁-C₈)alkylene group; a substituted (C₁-C₈)alkylene group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, halo(C₁-C₆)alkyl groups, (C₁-C₆) alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, (C₁-C₆)alkylthio(C₁-C₆)alkyl groups, (C₁-C₆) alkoxycarbonyl groups and phenyl group; a (C₃-C₈)alkenylene group; a substituted (C₃-C₈)alkenylene group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆) alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, (C₁-C₆)alkylthio (C₁-C₆)alkyl groups, (C₁-C₆)alkoxycarbonyl groups and phenyl group; a (C₃-C₈)alkynylene group; or a substituted (C₃-C₈)alkynylene group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, (C₁-C₆)alkylthio(C₁-C₆)alkyl groups, (C₁-C₆)alkoxycarbonyl groups and phenyl group, any of the saturated carbon atoms in the above-mentioned (C₁-C₆)alkylene group, substituted (C₁-C₈)alkylene group, (C₃-C₈)alkenylene group, substituted (C₃-C₈)alkenylene group, (C₃-C₈)alkynylene group or substituted

(C₃-C₈)alkynylene group being able to have a (C₂-C₅)alkylene group bonded thereto as a substituent, to form a (C₃-C₈)cycloalkane ring, and any two of the carbon atoms in the above-mentioned (C₁-C₈)alkylene group, substituted (C₁-C₈)alkylene group, (C₃-C₈)alkenylene group and substituted (C₃-C₈)alkenylene group being able to form a (C₃-C₈)cycloalkane ring or a (C₃-C₈)cycloalkene ring together with an alkylene group or an alkenylene group,

5 B is -O- or -N(R⁴)- (wherein R⁴ is a hydrogen atom; a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₃-C₆)alkenyl group; a halo (C₃-C₆)alkenyl group; a (C₃-C₆)alkynyl group; a (C₃-C₆)cycloalkyl group; a (C₁-C₆)alkylcarbonyl group; a halo(C₁-C₆)alkylcarbonyl group; a (C₁-C₆)alkoxycarbonyl group; a phenylcarbonyl group; a substituted phenylcarbonyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, and di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different; a phenyl(C₁-C₄)alkoxycarbonyl group; a substituted phenyl(C₁-C₄)alkoxycarbonyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group,

10 nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, and di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different; a phenyl(C₁-C₄)alkyl group; or a substituted phenyl(C₁-C₄)alkyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups),

15 R¹ is a hydrogen atom; a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₁-C₄)alkoxy(C₁-C₄)alkyl group; a (C₁-C₄)alkylthio(C₁-C₄)alkyl group; a (C₂-C₆)alkenyl group; a halo(C₂-C₆)alkenyl group; a (C₃-C₆)alkynyl group; a halo(C₃-C₆)alkynyl group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyl (C₁-C₄) alkyl group; a substituted phenyl(C₁-C₄)alkyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group,

20 group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; -P(=W¹) (-OR⁵) (-OR⁶) (wherein W¹ is an oxygen atom or a sulfur atom, and each of R⁵ and R⁶, which may be the same or different, is a hydrogen atom; a (C₁-C₆)alkyl group; a halo (C₁-C₆)alkyl group; a (C₁-C₄)alkoxy(C₁-C₄)alkyl group; a (C₁-C₄)alkylthio (C₁-C₄)alkyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyl (C₁-C₄) alkyl group; a substituted phenyl(C₁-C₄)alkyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group,

25 (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; or a substituted heterocyclic group having one or more substituents which may be the same or different and are selected

from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups,

further, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); -C(=W¹)-N(R⁵)(R⁶) (wherein W¹, R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, and R⁵ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); -C(=W¹)-R⁵ (wherein W¹ and R⁵ are as defined above); -C(=W¹)-W¹-R⁷ (wherein W¹s, which may be the same or different, are as defined above, and R⁷ is a (C₁-C₆)alkyl group; a halo (C₁-C₆)alkyl group; a (C₁-C₄)alkoxy(C₁-C₄)alkyl group; a (C₁-C₄)alkylthio(C₁-C₄)alkyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyl (C₁-C₄)alkyl group; a substituted phenyl(C₁-C₄)alkyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; or a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups); -SO₂-R⁷ (wherein R⁷ is as defined above); -SO₂-N(R⁵)(R⁶) (wherein R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, and R⁵ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain three or four atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); -N(R⁵)(R⁶) (wherein R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, and R⁵ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); or N=C(R⁵)R⁶ (wherein R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); in the case of B being -N(R⁴)-, R¹ being able to be -OR⁵ (wherein R⁵ is as defined above), -C(W²)-N(R⁵)R⁶ (wherein W² is =CH-NO₂, =N-NO₂ or =N-CN, and R⁵ and R⁶ are as defined above, R⁵ or R⁶ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring) or -C(W²)-W¹-R⁷ (wherein W¹, W² and R⁷ are as defined above, R⁷ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring), and R¹ being able to bind to A¹ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring,

each of R² and R³, which may be the same or different, is a hydrogen atom, a (C₃-C₆)cycloalkyl group or -A²-R⁸ (wherein A² is -C(=O)-, -C(=S)-, -C(=NR⁹)- (wherein R⁹ is a hydrogen atom, a (C₁-C₆)alkyl group, a (C₁-C₆)alkoxy group, a mono(C₁-C₆)alkylamino group, a di(C₁-C₆)alkylamino group whose (C₁-C₆)alkyl groups may be the same or different, a (C₁-C₆)alkoxycarbonyl group, a phenyl group, or a substituted phenyl group having one or more

substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups), a (C₁-C₈)alkylene group, a halo(C₁-C₈)alkylene group, a (C₃-C₆)alkenylene group, a halo(C₃-C₆)alkenylene group, a (C₃-C₆)alkynylene group or a halo(C₃-C₆)alkynylene group,

(1) in the case of A² being -C(=O)-, -C(=S)- or -C(=NR⁹)- (wherein R⁹ is as defined above), R⁸ is a hydrogen atom; a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; or -A³-R¹⁰ (wherein A³ is -O-, -S- or -N(R¹¹)- (wherein R¹¹ is a hydrogen atom; a (C₁-C₆)alkylcarbonyl group; a halo(C₁-C₆)alkylcarbonyl group; a (C₁-C₆)alkoxycarbonyl group; a phenylcarbonyl group; a substituted phenylcarbonyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyl(C₁-C₄)alkoxycarbonyl group; or a substituted phenyl(C₁-C₄)alkoxycarbonyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups), and R¹⁰ is a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₃-C₆)alkenyl group; a halo(C₃-C₆)alkenyl group; a (C₃-C₆)alkynyl group; a halo(C₃-C₆)alkynyl group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a (C₁-C₆)alkylcarbonyl group; a halo(C₁-C₆)alkylcarbonyl group; a (C₁-C₆)alkoxycarbonyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyl(C₁-C₄)alkyl group; a substituted phenyl(C₁-C₄)alkyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups),

(2) in the case of A² being a (C₁-C₈)alkylene group, a halo(C₁-C₈)alkylene group, a (C₃-C₆)alkenylene group, a halo(C₃-C₆)alkenylene group, a (C₃-C₆)alkynylene group or a halo(C₃-C₆)alkynylene group, R⁸ is a hydrogen atom; a halogen atom; a cyano group; a nitro group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group;

a (C₁-C₆)alkoxycarbonyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆) alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆) alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; or -A⁴-R¹² (wherein A⁴ is -O-, -S-, -SO-, -SO₂-, -N(R¹¹)- (wherein R¹¹ is as defined above), -C(=O)-, or -C(=N-OR¹³) (wherein R¹³ is a hydrogen atom, a (C₁-C₆)alkyl group, a halo(C₁-C₆)alkyl group, a (C₃-C₆)alkenyl group, a halo(C₃-C₆)alkenyl group, a (C₃-C₆)alkynyl group, a halo(C₃-C₆)alkynyl group, a (C₃-C₆)cycloalkyl group, a phenyl(C₁-C₄)alkyl group, or a substituted phenyl(C₁-C₄)alkyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆) alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups),

(i) in the case of A⁴ being -O-, -S-, -SO-, -SO₂- or -N(R¹¹)- (wherein R¹¹ is as defined above), R¹² is a hydrogen atom; a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₃-C₆)alkenyl group; a halo(C₃-C₆) alkenyl group; a (C₃-C₆)alkynyl group; a halo (C₃-C₆)alkynyl group; a (C₃-C₆)cycloalkyl group; a halo (C₃-C₆)cycloalkyl group; a (C₁-C₆)alkylcarbonyl group; a halo(C₁-C₆)alkylcarbonyl group; a (C₁-C₆)alkoxycarbonyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyl (C₁-C₄)alkyl group; a substituted phenyl(C₁-C₄)alkyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; or a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups,

(ii) in the case of A⁴ being -C(=O)- or -C(=NOR¹³) (wherein R¹³ is as defined above), R¹² is a hydrogen atom; a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₂-C₆)alkenyl group; a halo (C₂-C₆)alkenyl group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a (C₁-C₆)alkoxy group; a halo(C₁-C₆)alkoxy group; a (C₁-C₆)alkylthio group; a halo(C₁-C₆)alkylthio group; a mono (C₁-C₆)alkylamino group; a di (C₁-C₆)alkylamino group whose (C₁-C₆)alkyl groups may be the same or different; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenylamino group; a substituted phenylamino group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl

groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆) alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyloxy group; a substituted phenyloxy group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆) alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenylthio group; a substituted phenylthio group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆) alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; or a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆) alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups)),

further, R₂ being able to bind to A¹ or R¹ to form a 5- to 8-membered ring that may contain one to three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, each of Q¹ through Q⁵ is a carbon atom or a nitrogen atom, each of Xs, which may be the same or different, is a halogen atom; a cyano group; a nitro group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a (C₁-C₆)alkoxycarbonyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; or -A⁵-R¹⁴ (wherein A⁵ is -O-, -S-, -SO-, -SO₂-, -C(=O)-, -C(=NOR¹³) (wherein R¹³ is as defined above), a (C₁-C₆)alkylene group, a halo (C₁-C₆)alkylene group, a (C₂-C₆)alkenylene group, a halo(C₂-C₆)alkenylene group, a (C₂-C₆)alkynylene group or a halo(C₃-C₆)alkynylene group,

(1) in the case of A⁵ being -O-, -S-, -SO- or -SO₂-, R¹⁴ is a halo(C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkenyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; or -A⁶-R¹⁵ (wherein A⁶ is a (C₁-C₆)alkylene group, a halo (C₁-C₆)alkylene group, a (C₃-C₆)alkenylene group, a halo(C₃-C₆)alkenylene group, a (C₃-C₆)alkynylene group or a halo(C₃-C₆)alkynylene group, and R¹⁵ is a hydrogen atom; a halogen atom; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a (C₁-C₆)alkoxycarbonyl group; a phenyl group; a substituted phenyl group hav-

(2) in the case of A⁵ being -C(=O)- or -C(=NOR¹³)- (wherein R¹³ is as defined above), R¹⁴ is a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₂-C₆)alkenyl group; a halo(C₂-C₆)alkenyl group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a (C₁-C₆)alkoxy group; a (C₁-C₆)alkylthio group; a mono(C₁-C₆)alkylamino group; a di(C₁-C₆)alkylamino group whose (C₁-C₆)alkyl groups may be the same or different; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenylamino group; a substituted phenylamino group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; or a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups.

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groups; or -A⁵-R¹⁴ (wherein A⁵ and R¹⁴ are as defined above),

further, two adjacent Ys on the aromatic ring being able to be taken together to represent a fused ring that may have one or more substituents which may be the same or different and are selected from halogen atoms; (C₁-C₆) alkyl groups; halo(C₁-C₆)alkyl groups; (C₁-C₆)alkoxy groups; halo(C₁-C₆)alkoxy groups; (C₁-C₆)alkylthio groups; halo(C₁-C₆)alkylthio groups; (C₁-C₆)alkylsulfinyl groups; halo(C₁-C₆)alkylsulfinyl groups; (C₁-C₆)alkylsulfonyl groups; halo(C₁-C₆)alkylsulfonyl groups; phenyl group; substituted phenyl groups having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; heterocyclic groups; and substituted heterocyclic groups having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆) alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups,

m is an integer of 1 to 5, and each of Z¹ and Z² is an oxygen atom or a sulfur atom} or a salt thereof, an agricultural and horticultural chemical containing aromatic diamide derivative as an active ingredient, and a usage of the same.

MODE FOR CARRYING OUT THE INVENTION

[0006] In the definition of the general formula (I) shown for the aromatic diamide derivative or salt thereof of the present invention, the term "halogen atom" means a chlorine atom, a bromine atom, an iodine atom or a fluorine atom. The term "(C₁-C₆)alkyl" means a linear or branched alkyl group of 1 to 6 carbon atoms, such as methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, s-butyl, t-butyl, n-pentyl, n-hexyl or the like. The term "halo(C₁-C₆)alkyl" means a substituted and linear or branched alkyl group of 1 to 6 carbon atoms having as the substituent(s) one or more halogen atoms which may be the same or different. The term "(C₁-C₈)alkylene" means a linear or branched alkylene group of 1 to 8 carbon atoms, such as methylene, ethylene, propylene, trimethylene, dimethylmethylene, tetramethylene, isobutylene, dimethylethylene, octamethylene or the like. As "the 5- to 8-membered ring which R⁵ and R⁶ (or R² and A¹ or R¹) form by their binding to each other, i.e., the 5- to 8-membered ring that may contain one or two (or one to three) atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring" or "the 5- to 8-membered ring which R⁵ (or R⁶ or R⁷) and R⁴ form by their binding to each other, i.e., the 5- to 8-membered ring that may contain two or three, or three or four atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring", there can be exemplified azetidine ring, pyrrolidine ring, pyrroline ring, piperidine ring, imidazolidine ring, imidazoline ring, oxazolidine ring, thiazolidine ring, isoxazolidine ring, isothiazolidine ring, tetrahydropyridine ring, piperazine ring, morpholine ring, thiomorpholine ring, dioxazine ring, dithiazine ring, etc.

[0007] The "heterocyclic group" includes, for example, pyridyl group, pyridine-N-oxide group, pyrimidinyl group, furyl group, tetrahydrofuryl group, thienyl group, tetrahydrothienyl group, tetrahydropyranyl group, tetrahydrothiopyranyl group, oxazolyl group, isoxazolyl group, oxadiazolyl group, thiazolyl group, isothiazolyl group, thiadiazolyl group, imidazolyl group, triazolyl group and pyrazolyl group. The "fused ring" includes, for example, naphthalene, tetrahydronaphthalene, indene, indane, quinoline, quinoxaline, indole, indoline, chroman, isochroman, benzodioxane, benzodioxole, benzofuran, dihydrobenzofuran, benzothiophene, dihydrobenzothiophene, benzoxazole, benzothiazole, benzimidazole and indazole.

[0008] The salt of the aromatic diamide derivative of the general formula (I) of the present invention includes, for example, inorganic acid salts such as hydrochloride, sulfate, nitrate, phosphate and the like; organic acid salts such as acetate, fumarate, maleate, oxalate, methanesulfonate, benzenesulfonate, p-toluenesulfonate and the like; salts with a sodium ion, potassium ion, calcium ion or the like.

[0009] The aromatic diamide derivative of the general formula (I) or salt thereof of the present invention contains one or more asymmetric carbon atoms or asymmetric centers in its structural formula in some cases and has two or more optical isomers and diastereomers in some cases. The present invention also includes all of the individual optical isomers and mixtures consisting of these isomers in any ratio. The aromatic diamide derivative of the general formula (I) or salt thereof of the present invention has two geometrical isomers due to a carbon-carbon double bond or a carbon-nitrogen double bond in its structural formula in some cases. The present invention also includes all of the individual geometrical isomers and mixtures consisting of these isomers in any ratio. The present invention also includes hydrates of said compound, depending on the kind of the compound.

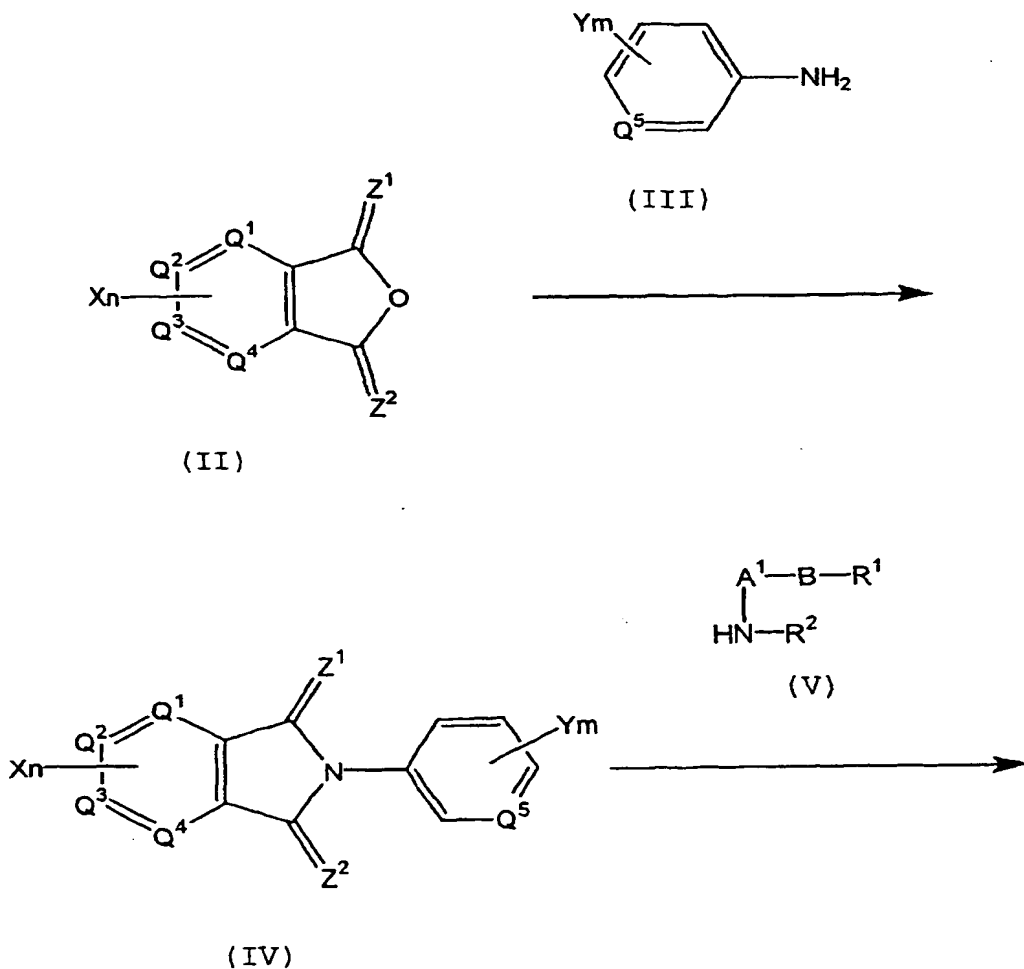
[0010] Preferable examples of the aromatic diamide derivative of the general formula (I) or salt thereof of the present

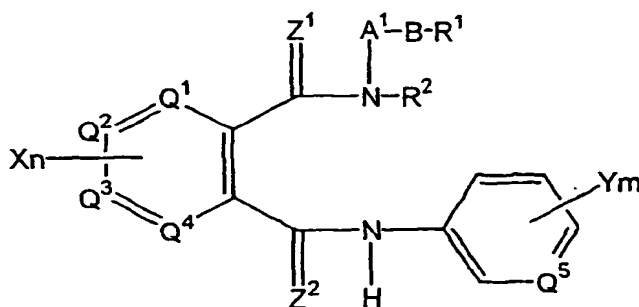
invention are aromatic diamide derivatives in which A¹ is a (C₁-C₄)alkylene group, B is -O- or -N(R⁴)- (wherein R⁴ is a hydrogen atom or a (C₁-C₃)alkyl group), R¹ is a hydrogen atom, a (C₁-C₃)alkyl group, a phenyl(C₁-C₃)alkyl group, a substituted phenyl(C₁-C₃)alkyl group, a (C₁-C₃)alkylcarbonyl group, a halo(C₁-C₃)alkylcarbonyl group, a (C₁-C₃)alkoxycarbonyl group, a mono (C₁-C₃)alkylaminocarbonyl group, a di (C₁-C₃)alkyl-aminocarbonyl group whose (C₁-C₃) alkyl groups may be the same or different, a (C₁-C₃)alkylsulfonyl group, a mono (C₁-C₃)alkylaminosulfonyl group, a di (C₁-C₃)alkyl-aminosulfonyl group whose (C₁-C₃)alkyl groups may be the same or different, a di(C₁-C₃)alkoxyphosphono group whose (C₁-C₃)alkyl groups may be the same or different, or a di(C₁-C₃)alkoxythiophosphono group whose (C₁-C₃)alkyl groups may be the same or different, each of R² and R³ is a hydrogen atom or a (C₁-C₃)alkyl group, each of Q¹ through Q⁴ is a carbon atom, X is a halogen atom, a nitro group, a halo(C₁-C₆)alkyl group, a halo(C₁-C₆)alkoxy group or a halo(C₁-C₆)alkylthio group, n is an integer of 0 to 2, Q⁵ is a carbon atom or a nitrogen atom, each of Ys, which may be the same or different, is a halogen atom, a (C₁-C₃)alkyl group, a halo(C₁-C₃)alkyl group, a (C₁-C₃)alkoxy group, a halo(C₁-C₃)alkoxy group, a halo(C₁-C₃)alkylthio group or a halo (C₁-C₃)alkoxyhalo (C₁-C₃)alkoxy group, m is an integer of 1 to 3, each of Z¹ and Z² is an oxygen atom; or salts thereof.

[0011] The aromatic diamide derivative of the general formula (I) or salt thereof of the present invention can be produced, for example, by the production process illustrated below. In the present invention, the production can be carried out also by, for example, the process disclosed in JP-A-11-240857. A process for the production, however, is not limited to these production processes.

Production process 1.

[0012]





(I-1)

wherein R^1 , R^2 , R^3 , A^1 , B , Q^1 through Q^5 , X , n , Y , m , Z^1 and Z^2 are as defined above.

[0013] An aromatic diamide derivative of the general formula (I-1) can be obtained by allowing an aromatic carboxylic acid anhydride derivative of the general formula (II) to react with an aromatic amine of the general formula (III) in the presence of an inert solvent to obtain an aromatic imide derivative of the general formula (IV), and allowing said aromatic imide derivative (IV) to react with an amine of the general formula (V) after or without isolation of the aromatic imide derivative (IV).

(1). General formula (II) \rightarrow general formula (IV)

[0014] As the inert solvent usable in this reaction, any inert solvent may be used so long as it does not markedly inhibit the progress of the reaction. There can be exemplified inert solvents including aromatic hydrocarbons such as benzene, toluene, xylene, etc.; halogenated hydrocarbons such as methylene chloride, chloroform, carbon tetrachloride, etc.; chlorinated aromatic hydrocarbons such as chlorobenzene, dichlorobenzene, etc.; acyclic or cyclic ethers such as diethyl ether, dioxane, tetrahydrofuran, etc.; esters such as ethyl acetate, etc.; amides such as dimethylformamide, dimethylacetamide, etc.; acids such as acetic acid, etc.; dimethyl sulfoxide; 1,3-dimethyl-2-imidazolidinone; and the like. These inert solvents may be used singly or as a mixture thereof.

[0015] Since the reaction is an equimolar reaction, it is sufficient that the reactants are used in equimolar amounts, though either of them may be used in excess. If necessary, the reaction may be carried out under dehydrating conditions.

[0016] As to the reaction temperature, the reaction can be carried out at room temperature to the reflux temperature of the inert solvent used. Although the reaction time is varied depending on the scale of reaction, the reaction temperature, etc., it may be properly chosen in the range of several minutes to 48 hours.

[0017] After completion of the reaction, the desired compound is isolated from the reaction system containing the desired compound by a conventional method, and if necessary, purified by recrystallization, column chromatography, etc., whereby the desired compound can be produced. The desired compound can be subjected to the subsequent reaction step without isolation from the reaction system.

[0018] The aromatic carboxylic acid anhydride derivative of the general formula (II) can be produced by any of the processes described in J. Org. Chem., 52, 129 (1987), J. Am. Chem. Soc., 51, 1865 (1 to 29), ditto 63, 1542 (1941), etc. The aromatic amine of the general formula (III) can be produced by any of the processes described in J. Org. Chem., 29, 1 (1964), Angew. Chem. Int. Ed. Engl., 24, 871 (1985), Synthesis, 1984, 667, Journal of Chemical Society of Japan, 1973, 2351, German Patent Laid-Open DE-2606982, JP-A-1-90163, etc.

(2). General formula (IV) \rightarrow general formula (I-1)

[0019] As an inert solvent usable in this reaction, those exemplified as the inert solvent usable in (1) can be exemplified.

[0020] Since the reaction is an equimolar reaction, it is sufficient that the reactants are used in equimolar amounts, though the amine of the general formula (V) may be used in excess.

[0021] As to the reaction temperature, the reaction can be carried out at room temperature to the reflux temperature of the inert solvent used. Although the reaction time is varied depending on the scale of reaction, the reaction temperature, etc., it may be properly chosen in the range of several minutes to 48 hours.

[0022] After completion of the reaction, the desired compound is isolated from the reaction system containing the desired compound by a conventional method, and if necessary, purified by recrystallization, column chromatography, etc., whereby the desired compound can be produced.

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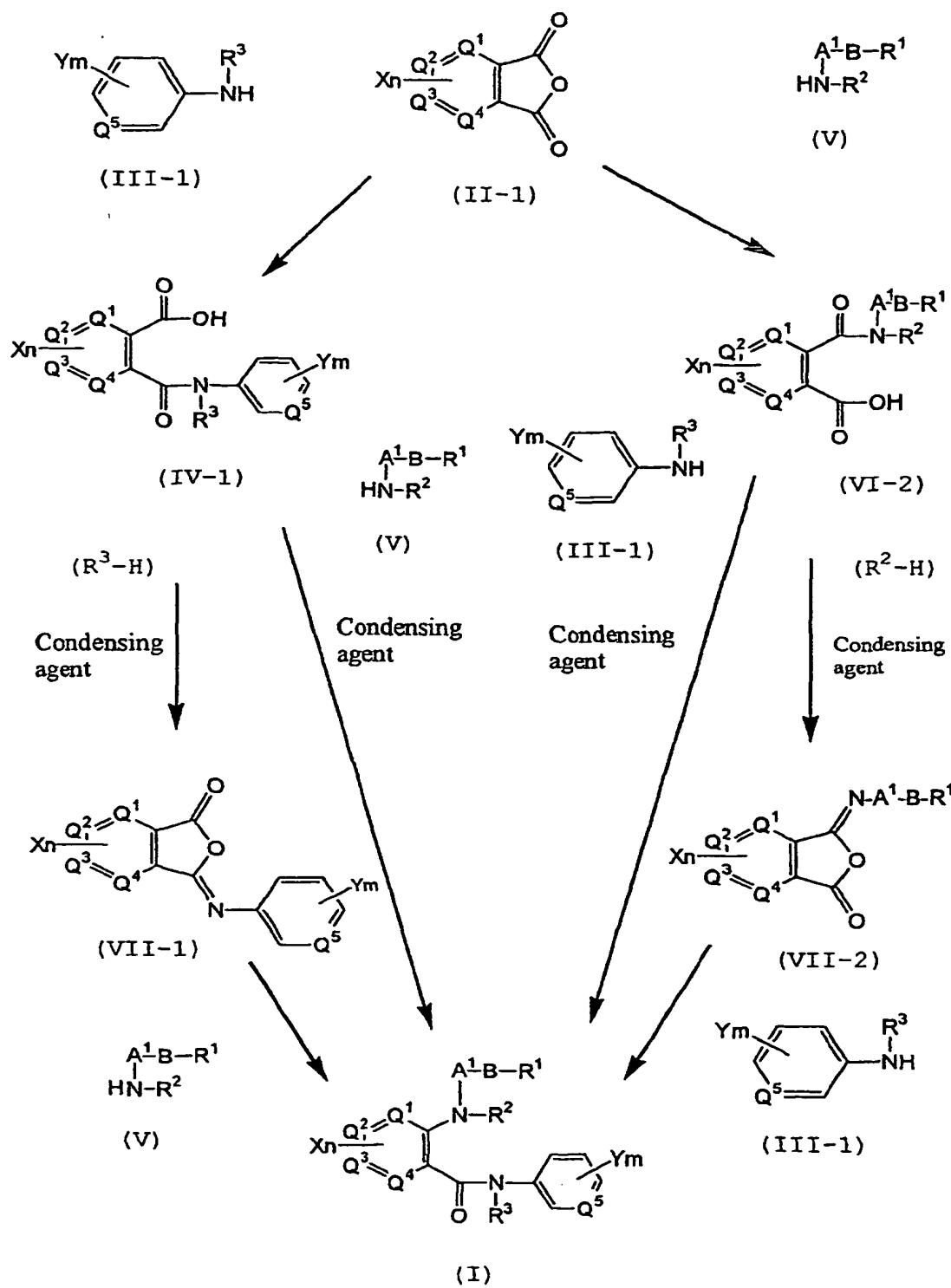
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Production process 2.

[0023]



wherein R¹, R², R³, A¹, B, Q¹ through Q⁵, X, n, Y, m, Z¹ and Z² are as defined above.

[0024] An aromatic diamide derivative of the general formula (I) can be produced by allowing an aromatic carboxylic acid anhydride derivative of the general formula (II-1) to react with an amine of the general formula (V) in the presence of an inert solvent to obtain a phthalamide of the general formula (VI-2), and treating this aromatic amide (VI-2) as follows after or without isolation. When R² of the aromatic amide (VI-2) is a hydrogen atom, the aromatic amide (VI-2) is subjected to condensation reaction in the presence of a condensing agent to obtain a compound of the general formula (VII-2), which is allowed to react with an aromatic amine of the general formula (III-1) in the presence of an inert solvent after or without isolation of the compound (VII-2). When R² of the aromatic amide (VI-2) is other than a hydrogen atom, the aromatic amide (VI-2) is condensed with an aromatic amine of the general formula (III-1) in the presence of a condensing agent.

[0025] Alternatively, an aromatic diamide derivative of the general formula (I) can be produced by allowing an aromatic carboxylic acid anhydride derivative of the general formula (II-1) to react with an aromatic amine of the general formula (III-1) in the presence of an inert solvent to obtain an aromatic amide of the general formula (VI-1), and treating the aromatic amide (VI-1) as follows after or without isolation. When R³ of the aromatic amide (VI-1) is a hydrogen atom, the aromatic amide (VI-1) is subjected to condensation reaction in the presence of a condensing agent to obtain a compound of the general formula (VII-1), which is allowed to react with an amine of the general formula (V) in the presence of an inert solvent after or without isolation of the compound (VII-1). When R³ of the aromatic amide (VI-1) is other than a hydrogen atom, the aromatic amide (VI-1) is condensed with an amine of the general formula (V) in the presence of a condensing agent.

(1). General formula (II-1) → general formula (VI-1), or general formula (II-1) → general formula (VI-2)

[0026] In the case of either of these reactions, the desired compound can be produced in a manner similar to that described in production process 1-(2).

(2). General formula (VII-1) or general formula (VII-2) → general formula (I)

[0027] In the case of this reaction, the desired compound can be produced in a manner similar to that described in production process 1-(2).

(3). General formula (VI-1) → general formula (VII-1), or general formula (VI-2) → general formula (VII-2)

[0028] In the case of either of these reactions, the desired compound can be produced according to the process described in J. Med. Chem., 10, 982 (1967).

(4). General formula (VI-1) or general formula (VI-2) → general formula (I)

[0029] The desired compound can be produced by allowing an aromatic amide derivative of the general formula (VI-1) or the general formula (VI-2) to react with an amine of the general formula (V) or the general formula (III-1), respectively, in the presence of a condensing agent and an inert solvent. If necessary, the reaction can be carried out in the presence of a base.

[0030] The inert solvent used in the reaction includes, for example, tetrahydrofuran, diethyl ether, dioxane, methylene chloride and chloroform.

[0031] As the condensing agent used in the reaction, any condensing agent used in conventional amide production may be used. There can be exemplified Mukaiyama reagent (2-chloro-N-methylpyridinium iodide), DCC (1,3-dicyclohexylcarbodiimide), CDI (carbonyldiimidazole) and DEPC (diethyl cyanophosphate). As to the amount of the condensing agent used, the condensing agent may be used in an amount properly chosen in the range of 1 mole to excess moles per mole of the aromatic amide derivative of the general formula (VI-1) or the general formula (VI-2).

[0032] The base usable in the reaction includes, for example, organic bases such as triethylamine, pyridine, etc., and inorganic bases such as potassium carbonate, etc. As to the amount of the base used, the base may be used in an amount properly chosen in the range of 1 mole to excess moles per mole of the aromatic amide derivative of the general formula (VI-1) or the general formula (VI-2).

[0033] As to the reaction temperature, the reaction can be carried out at 0°C to the boiling point of the inert solvent used. Although the reaction time is varied depending on the scale of reaction, the reaction temperature, etc., it ranges from several minutes to 48 hours.

[0034] After completion of the reaction, the desired compound is isolated from the reaction system containing the desired compound by a conventional method, and if necessary, purified by recrystallization, column chromatography, etc., whereby the desired compound can be produced.

[0035] Typical compounds as the aromatic diamide derivative of the general formula (I) or a salt thereof are listed in Table 1 or Table 2 but they are not intended in any way to limit the scope of the present invention. In the following tables, Me indicates methyl, Et ethyl, Pro propyl, Bu butyl, Ph phenyl, Pyr pyridyl, and c- an alicyclic hydrocarbon.

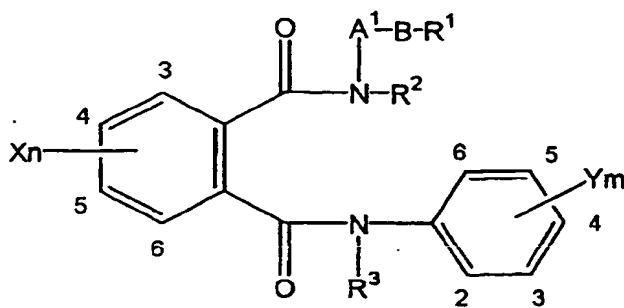


Table 1 ($Z^1=Z^2=0$, $R^3=H$, $Q^1\sim Q^5=C$, unless otherwise specified.)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
1	$(CH_2)NHCO_2Pr-i$	H	3-I	2-Me-4-CF(CF ₃) ₂	105
2	$(CH_2)NHCO_2Pr-i$	H	3-I	2-Me-4-OCF ₃	200
3	$(CH_2)NHCO_2Et$	H	3-I	H	175
4	$(CH_2)NHCO_2Et$	H	3-I	4-CF ₂ CF ₃	180
5	$(CH_2)NHCO_2Me$	H	3-I	H	200
6	$(CH_2)NHCO_2Me$	H	3-I	2-Me-4-CF ₂ CF ₃	130
7	$(CH_2)NHCO_2Me$	H	3-I	2-Me-4-CF(CF ₃) ₂	160
8	$C(Me)_2CH_2NHCO_2Et$	H	3-I	2-Me-4-CF(CF ₃) ₂	240
9	$C(Me)_2CH_2NHCO_2Et$	H	6-I	2-Me-4-CF(CF ₃) ₂	140
10	$C(Me)_2CH_2NHCO_2Et$	H	3-I	2-Me-4-OCF ₃	155
11	$C(Me)_2CH_2NHCO_2Et$	H	6-I	2-Me-4-OCF ₃	220
12	$C(Me)_2CH_2NHCO_2Me$	H	3-I	2-Me-4-CF(CF ₃) ₂	100
13	$C(Me)_2CH_2NHCO_2Me$	H	6-I	2-Me-4-CF(CF ₃) ₂	230
14	$C(Me)_2CH_2NHCO_2Pr$	H	3-I	2-Me-4-CF(CF ₃) ₂	100
15	$C(Me)_2CH_2NHCO_2Me$	H	3-I	2-Me-4-OCF ₃	95
16	$C(Me)_2CH_2NHCO_2Me$	H	6-I	2-Me-4-OCF ₃	120
17	$C(Me)_2CH_2NHCO_2Et$	H	3-I	2-Me	95
18	$C(Me)_2CH_2NHCO_2Et$	H	6-I	2-Me	120

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
19	$C(Me)_2CH_2NHCO_2Et$	H	3-I	2-Me-4- CF_2CF_3	200
20	$(CH_2)_3NHCO_2Bu-t$	H	3-I	2-Me-4- $CF(CF_3)_2$	145
21	$(CH_2)_3NHCO_2Me$	H	3-I	2-Me-4- $CF(CF_3)_2$	80
22	$CH(Me)CH_2NHCO_2Me$	H	3-I	2-Me-4- $CF(CF_3)_2$	175
23	Q	H	3-I	2-Me-4- $CF(CF_3)_2$	235
24	Q	H	6-I	2-Me-4- $CF(CF_3)_2$	225
25	Q	H	3-I	2-Me-4- OCF_3	220
26	Q	H	6-I	H	225
27	$C(Me)_2CH_2NHCOPh$	H	3-I	2-Me-4- $CF(CF_3)_2$	240
28	$C(Me)_2CH_2NHCOMe$	H	3-I	2-Me-4- $CF(CF_3)_2$	125
29	$C(Me)_2CH_2NHCOPr-c$	H	3-I	2-Me-4- $CF(CF_3)_2$	230
30	$C(Me)_2CH_2NHCOBu-t$	H	3-I	2-Me-4- $CF(CF_3)_2$	160
31	$(CH_2)_2NHCOMe$	H	3-I	2-Me-4- $CF(CF_3)_2$	210
32	$(CH_2)_2NHCOMe$	H	3-I	2-Me-4- OCF_3	210
33	$CH(Me)CH_2NHCOMe$	H	3-I	2-Me-4- $CF(CF_3)_2$	140
34	$CH(Me)CH_2NHCOEt$	H	3-I	2-Me-4- $CF(CF_3)_2$	230
35	$C(Me)_2CH_2NHCOEt$	H	3-I	2-Me-4- $CF(CF_3)_2$	220
36	$CH(Me)CH_2NHCOMe$	H	3-I	2-Me-4- OCF_3	215
37	$(CH_2)_2NHCON(Me)_2$	H	3-I	2-Me-4- $CF(CF_3)_2$	170
38	$CH(Me)CH_2NHCON(Me)_2$	H	3-I	2-Me-4- $CF(CF_3)_2$	250
39	$CH(Me)CH_2NHOSO_2Me$	H	3-I	2-Me-4- $CF(CF_3)_2$	110
40	$CH(Me)CH_2NHOSO_2Ph$	H	3-I	2-Me-4- $CF(CF_3)_2$	130
41	$CH(Me)CH_2NHOSO_2Et$	H	3-I	2-Me-4- $CF(CF_3)_2$	155
42	$CH(Me)CH_2N(Me)SO_2Me$	H	3-I	2-Me-4- $CF(CF_3)_2$	100
43	$CH(Me)CH_2N(Me)SO_2Me$	H	3-I	2-Me-4- OCF_3	200

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
44	CH(Me)CH ₂ N(Me)SO ₂ Me	H	3-I	H	250
45	CH(Me)CH ₂ NHSO ₂ N(Me) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	95
46	(CH ₂) ₃ N(Me) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	155
47	(CH ₂) ₃ N(Me) ₂	H	3-I	2-Me-4-OCF ₃	115
48	CH(Me)CH ₂ NH- P(=S)(OMe) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	175
49	CH(Me)CH ₂ NH- P(=S)(OMe) ₂	H	3-I	2-Me-4-OCF ₃	125
50	CH(Me)CH ₂ NH- P(=S)(OEt) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	180
51	CH ₂ -(2,2-Me ₂ -1,3-Dioxolan-4-yl)	H	3-I	2-Me-4-CF(CF ₃) ₂	170
52	CH ₂ -(2,2-Me ₂ -1,3-Dioxolan-4-yl)	H	3-I	2-Me-4-OCF ₃	165
53	CH ₂ -(tetrahydropyran-4-yl)	H	3-I	2-Me-4-OCF ₃	176
54	CH ₂ -(tetrahydropyran-4-yl)	H	3-I	2-Me-4-CF(CF ₃) ₂	145
55	CH ₂ OMe	Et	3-Cl	2-Me-4-CF(CF ₃) ₂	136
56	CH(Me)CH ₂ OMe	H	3-I	2-Me-4-CF(CF ₃) ₂	136
57	CH(Me)CH ₂ OMe	H	3-I	2-Me-4-OCF ₃	137
58	CH(Me)CH ₂ OH	H	3-Cl	2-Me-4-CF(CF ₃) ₂	200
59	CH(Me)(CH ₂) ₂ OMe	H	3-I	2-Me-4-CF(CF ₃) ₂	164
60	C(Me) ₂ CH ₂ OH	H	3-I	2-Me-4-CF(CF ₃) ₂	210
61	C[-(CH ₂) ₄ -]CH ₂ OH	H	3-I	2-Me-4-CF(CF ₃) ₂	207

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
62	$CH(Me)(CH_2)_2OCH_2CF_3$	H	3-I	2-Me-4-CF(CF ₃) ₂	191
63	$CH(Me)(CH_2)_2OEt$	H	3-I	2-Me-4-CF(CF ₃) ₂	100
64	$CH(Me)(CH_2)_2OEt$	H	3-I	2-Me-4-OCF ₃	164
65	$CH(Me)(CH_2)_2OEt$	H	3-I	2-Cl-4-OCF ₃	151
66	$CH(Me)(CH_2)_2O-$ $(CH_2)_2OMe$	H	3-I	2-Me-4-CF(CF ₃) ₂	71
67	$CH(Me)CH_2OEt$	H	3-I	2-Me-4-CF(CF ₃) ₂	171
68	$CH(Me)CH_2OCH_2Ph$	H	3-I	2-Me-4-CF(CF ₃) ₂	186
69	$CH(Me)CH_2OPr$	H	3-I	2-Me-4-CF(CF ₃) ₂	160
70	$CH(Me)(CH_2)_2OPr$	H	3-I	2-Me-4-CF(CF ₃) ₂	146
71	$CH(Me)CH_2O(CH_2)_2OMe$	H	3-I	2-Me-4-CF(CF ₃) ₂	153
72	$CH(Me)CH_2OBu-i$	H	3-I	2-Me-4-CF(CF ₃) ₂	188
73	$CH(Me)CH_2OBu-i$	H	3-I	2-OPh	113
74	$CH(Me)(CH_2)_2OBu-i$	H	3-I	2-Me-4-CF(CF ₃) ₂	158
75	$CH(Me)(CH_2)_2OBu-i$	H	3-I	4-Cl	204
76	$CH(Me)CH_2O(CH_2)_2SMe$	H	3-I	2-Me-4-CF(CF ₃) ₂	168
77	$CH(Me)CH_2O(CH_2)_2SEt$	H	3-I	2-Me-4-CF(CF ₃) ₂	140
78	$CH(Me)CH_2OPh$	H	3-I	2-Me-4-CF(CF ₃) ₂	110
79	$CH(Me)CH_2OPh$	H	3-I	H	130
80	$CH(Me)CH_2OPh$	H	H	2-Me-4-CF(CF ₃) ₂	Amorphous
81	$CH(Me)CH_2O(4-Cl-Ph)$	H	3-I	2-Me-4-CF(CF ₃) ₂	200
82	$CH(Me)CH_2O(4-Cl-Ph)$	H	3-I	2,4,6-(Me) ₃	220
83	$CH(Me)CH_2O(3-CF_3-Ph)$	H	3-I	2-Me-4-CF(CF ₃) ₂	100
84	$CH(Me)CH_2O(3-CF_3-Ph)$	H	3-I	2-Me-4-OCF ₃	140
85	$CH(Me)CH_2OCOMe$	H	3-I	2-Me-4-CF(CF ₃) ₂	110

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
86	CH(Me)CH ₂ OCOMe	H	3-I	2-Me-4-OCF ₃	155
87	C(Me) ₂ CH ₂ OCOMe	H	3-I	2-Me-4-CF(CF ₃) ₂	180
88	CH(Me)CH ₂ OCON(Me) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	100
89	CH(Me)CH ₂ OCON(Me) ₂	H	3-I	2-Me-4-OCF ₃	140
90	CH(Me)CH ₂ OCON(Et) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	190
91	C(Me) ₂ CH ₂ OCON(Me) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	115
92	C(Me) ₂ CH ₂ OCON(Me) ₂	H	3-I	2-Me-4-OCF ₃	150
93	CH(Me)CH ₂ OCON(Pr-i) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	100
94	CH(Me)CH ₂ OCON(Me)Ph	H	3-I	2-Me-4-CF(CF ₃) ₂	105
95	CH(Me)CH ₂ OCO- N(-CH ₂ CH ₂ OCH ₂ CH ₂ -)	H	3-I	2-Me-4-CF(CF ₃) ₂	255
96	CH(Me)CH ₂ OCONHET	H	3-I	2-Me-4-CF(CF ₃) ₂	185
97	CH(Me)CH ₂ OCONHET	H	3-I	2-Me-4-OCF ₃	220
98	CH(Me)CH ₂ OCO- N(-CH ₂ CH ₂ CH ₂ CH ₂ -)	H	3-I	2-Me-4-CF(CF ₃) ₂	Amorphous
99	CH(Me)CH ₂ OCONHPr-i	H	3-I	2-Me-4-CF(CF ₃) ₂	130
100	C(Me) ₂ CH ₂ OCONHET	H	3-I	2-Me-4-CF(CF ₃) ₂	225
101	CH(Me)CH ₂ OCONHMe	H	3-I	2-Me-4-CF(CF ₃) ₂	190
102	CH(Me)CH ₂ OCONHMe	H	3-I	2-Me-4-OCF ₃	200
103	CH(Me)CH ₂ OCONHPr	H	3-I	2-Me-4-CF(CF ₃) ₂	175
104	CH(Me)CH ₂ OCONHPr	H	3-I	2-Me-4-OCF ₃	205
105	CH(Me)CH ₂ OCONHPr-i	H	3-I	2-Me-4-CF(CF ₃) ₂	170
106	CH(Me)CH ₂ OCONHPr-i	H	3-I	2-Me-4-OCF ₃	215
107	CH(Me)CH ₂ OCONHCH ₂ Ph	H	3-I	2-Me-4-CF(CF ₃) ₂	175
108	CH(Me)CH ₂ OCONHCH ₂ Ph	H	3-I	2-Me-4-OCF ₃	190

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
109	CH(Me)CH ₂ OCONHPh	H	3-I	2-Me-4-CF(CF ₃) ₂	190
110	CH(Me)CH ₂ OCONHPh	H	3-I	2-Me-4-OCF ₃	230
111	CH(Me)CH ₂ O- P(=S)(OMe) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	115
112	CH(Me)CH ₂ O- P(=S)(OEt) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	140
113	CH(Me)CH ₂ O- P(=S)(OEt) ₂	H	3-I	2-Me-4-OCF ₃	115
114	CH(Me)CH ₂ O- P(=S)(OEt) ₂	H	3-I	H	125
115	CH(Me)CH ₂ O- P(=S)(OEt) ₂	H	3-I	2-Me	95
116	C(Me) ₂ CH ₂ O- P(=S)(OMe) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	120
117	CH(Me)CH ₂ O- P(=O)(OEt) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	Amorphous
118	CH(Me)CH ₂ O- P(=O)(OEt) ₂	H	3-I	H	Amorphous

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Note: In the table, Q denotes the following group:

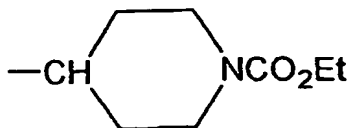


Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	Xn	Ym	Physical property: Melting point °C
119	CH (Me) CH ₂ OCOCF ₃	H	3-NO ₂	2-Me-4-CF (CF ₃) ₂	209
120	C (Me) ₂ CH ₂ OCOCF ₃	H	3-I	2-Me-4-CF (CF ₃) ₂	190
121	C (Me) ₂ CH ₂ OCOCF ₃	H	3-I	2-Cl-4-CF (CF ₃) ₂	150
122	C (Me) ₂ CH ₂ OCOCF ₃	H	6-I	2-Cl-4-CF (CF ₃) ₂	95
123	CH (Me) CH ₂ OCO-Ph	H	3-I	2-Me-4-CF (CF ₃) ₂	
124	C (Me) ₂ CH ₂ OCO-Ph	H	3-I	2-Me-4-CF (CF ₃) ₂	
125	CH (Me) CH ₂ OCO- (3-Pyr)	H	3-I	2-Me-4-CF (CF ₃) ₂	
126	C (Me) ₂ CH ₂ OCO- (3-Pyr)	H	3-I	2-Me-4-CF (CF ₃) ₂	
127	(CH ₂) ₂ OCONHEt	Me	H	2-Me-4-CF ₂ CF ₃	52
128	(CH ₂) ₂ OCONHEt	Me	H	2-Me-4-CF (CF ₃) ₂	113
129	C (Me) ₂ CH ₂ OCONHPr-n	H	3-I	2-Me-4-CF (CF ₃) ₂	220
130	C (Me) ₂ CH ₂ OCONHPr-n	H	3-I	2-Cl-4-CF (CF ₃) ₂	200
131	CH (Me) CH ₂ OCONHPr-i	H	3-I	2-Me-4-CF (CF ₃) ₂	
132	C (Me) ₂ CH ₂ OCONHPr-i	H	3-I	2-Me-4-CF (CF ₃) ₂	
133	CH (Me) CH ₂ OCONHPr-c	H	3-I	2-Me-4-CF (CF ₃) ₂	114
134	CH (Me) CH ₂ OCONHPr-c	H	3-I	2-Me-4-OCF ₃	212
135	C (Me) ₂ CH ₂ OCONHPr-c	H	H	2-Me-4-CF (CF ₃) ₂	176
136	C (Me) ₂ CH ₂ OCONHPr-c	H	3-I	2-Me-4-CF (CF ₃) ₂	231
137	C (Me) ₂ CH ₂ OCONHBu-n	H	3-I	2-Me-4-CF (CF ₃) ₂	
138	C (Me) ₂ CH ₂ OCONHBu-s	H	3-I	2-Me-4-CF (CF ₃) ₂	
139	CH (Me) CH ₂ OCONHBu-t	H	3-I	2-Me-4-CF (CF ₃) ₂	215
140	CH (Me) CH ₂ OCONHBu-t	H	3-I	2-Cl-4-CF (CF ₃) ₂	190

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
141	$C(Me)_2CH_2OCONHBu-c$	H	3-I	2-Me-4-CF(CF ₃) ₂	189
142	$CH(Me)CH_2OCONH-$ $CH_2C=CH_2$	H	3-I	2-Me-4-CF(CF ₃) ₂	
143	$C(Me)_2CH_2OCONH-$ $CH_2C=CH_2$	H	H	2-Me-4-CF(CF ₃) ₂	174
144	$C(Me)_2CH_2OCONH-$ $CH_2C=CH_2$	H	3-I	2-Me-4-CF(CF ₃) ₂	181
145	$C(Me)_2CH_2OCONH-$ $CH_2C=CH_2$	H	3-I	2-Me-4-OCF ₃	196
146	$CH(Me)CH_2OCONH-$ $CH_2C\equiv CH$	H	3-I	2-Me-4-CF(CF ₃) ₂	124
147	$C(Me)_2CH_2OCONH-$ $CH_2C\equiv CH$	H	3-I	2-Me-4-OCF ₃	
148	$CH(Me)CH_2OCONHCH_2CF_3$	H	3-I	2-Me-4-CF(CF ₃) ₂	196
149	$C(Me)_2CH_2OCONHCH_2CF_3$	H	3-I	2-Me-4-CF(CF ₃) ₂	170
150	$C(Me)_2CH_2OCONHCH_2-$ $COOMe$	H	3-I	2-Me-4-CF(CF ₃) ₂	
151	$C(Me)_2CH_2OCONHCH_2-$ $CON(Et)_2$	H	3-I	2-Me-4-CF(CF ₃) ₂	185
152	$C(Me)_2CH_2OCONHCH_2-Ph$	H	3-I	2-Me-4-CF(CF ₃) ₂	
153	$C(Me)_2CH_2OCONHCH_2-Ph$	H	3-I	2-Cl-4-CF(CF ₃) ₂	

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
154	CH (Me) CH ₂ OCON (CH ₃) - CH ₂ -Ph	H	3-I	2-Me-4-CF (CF ₃) ₂	Paste
155	CH (Me) CH ₂ OCONHCH ₂ - (2-Cl-Ph)	H	3-I	2-Me-4-CF (CF ₃) ₂	
156	CH (Me) CH ₂ OCONHCH ₂ - (3-Cl-Ph)	H	3-I	2-Me-4-CF (CF ₃) ₂	
157	CH (Me) CH ₂ OCONHCH ₂ - (4-Cl-Ph)	H	3-I	2-Me-4-CF (CF ₃) ₂	181
158	CH (Me) CH ₂ OCONHCH ₂ - (2-Me-Ph)	H	3-I	2-Me-4-CF (CF ₃) ₂	170
159	CH (Me) CH ₂ OCONHCH ₂ - (4-Me-Ph)	H	3-I	2-Me-4-CF (CF ₃) ₂	188
160	CH (Me) CH ₂ OCONHCH ₂ - (2-OMe-Ph)	H	3-I	2-Me-4-CF (CF ₃) ₂	
161	CH (Me) CH ₂ OCONHCH ₂ - (4-OMe-Ph)	H	3-I	2-Me-4-CF (CF ₃) ₂	178
162	CH (Me) CH ₂ OCONHCH ₂ - (4-CF ₃ -Ph)	H	3-I	2-Me-4-CF (CF ₃) ₂	186
163	CH (Me) CH ₂ OCONHCH ₂ - (2-Pyr)	H	3-I	2-Me-4-CF (CF ₃) ₂	
164	CH (Me) CH ₂ OCONHCH ₂ - [2-(3-Cl-5-CF ₃ -Pyr)]	H	3-I	2-Me-4-CF (CF ₃) ₂	

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
165	CH (Me) CH ₂ OCONHCH ₂ - (3-Pyr)	H	3-I	2-Me-4-CF (CF ₃) ₂	84
166	CH (Me) CH ₂ OCONHCH ₂ - [3- (6-Cl-Pyr)]	H	3-I	2-Me-4-CF (CF ₃) ₂	
167	CH (Me) CH ₂ OCONHCH ₂ - (4-Pyr)	H	H	2-Me-4-CF (CF ₃) ₂	137
168	CH (Me) CH ₂ OCONHCH ₂ - (4-Pyr)	H	3-I	2-Me-4-CF (CF ₃) ₂	140
169	CH (Me) CH ₂ OCONHCH ₂ [5- CF ₃ -1,3,4-Triadiazol -2-yl]	H	3-I	2-Me-4-CF (CF ₃) ₂	169
170	CH (Me) CH ₂ OCONH (CH ₂) ₂ -OMe	H	3-I	2-Me-4-CF (CF ₃) ₂	Paste
171	CH (Me) CH ₂ OCONH (CH ₂) ₂ -OMe	H	3-I	2-Me-4-OCF ₃	231
172	C (Me) ₂ CH ₂ OCONH (CH ₂) ₂ -OMe	H	3-I	2-Me-4-CF (CF ₃) ₂	184
173	C (Me) ₂ CH ₂ OCONH (CH ₂) ₂ -OMe	H	3-I	2-Me-4-OCF ₃	135
174	CH (Me) CH ₂ OCONH (CH ₂) ₃ -OMe	H	3-I	2-Me-4-CF (CF ₃) ₂	

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
175	$C(Me)_2CH_2OCONH(CH_2)_3$ -OMe	H	3-I	2-Me-4-OCF ₃	
176	$CH(Me)CH_2OCONH(CH_2)_2$ -SMe	H	3-I	2-Me-4-CF(CF ₃) ₂	
177	$CH(Me)CH_2OCONH(CH_2)_2$ -SMe	H	3-I	2-Me-4-OCF ₃	
178	$C(Me)_2CH_2OCONH(CH_2)_2$ -SMe	H	3-I	2-Me-4-CF(CF ₃) ₂	
179	$C(Me)_2CH_2OCONH(CH_2)_2$ -SMe	H	3-I	2-Me-4-OCF ₃	
180	$CH(Me)CH_2OCONH(CH_2)_2$ -SOMe	H	3-I	2-Me-4-CF(CF ₃) ₂	
181	$CH(Me)CH_2OCONH(CH_2)_2$ -SOMe	H	3-I	2-Me-4-OCF ₃	
182	$CH(Me)CH_2OCONH(CH_2)_3$ -SMe	H	3-I	2-Me-4-CF(CF ₃) ₂	171
183	$CH(Me)CH_2OCONH(CH_2)_3$ -SMe	H	3-I	2-Me-4-OCF ₃	176
184	$C(Me)_2CH_2OCONH(CH_2)_3$ -SMe	H	3-I	2-Me-4-CF(CF ₃) ₂	95
185	$C(Me)_2CH_2OCONH(CH_2)_3$ -SMe	H	3-I	2-Me-4-OCHF ₂	178

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
186	$C(Me)_2CH_2OCONH(CH_2)_3$ -SO ₂ Me	H	3-I	2-Me-4-CF(CF ₃) ₂	166
187	$C(Me)_2CH_2OCONH(CH_2)_3$ -SO ₂ Me	H	3-I	2-Me-4-OCF ₃	
188	CH(Me)CH ₂ OC(=S)NH ₂ t	H	3-I	2-Me-4-CF(CF ₃) ₂	
189	$C(Me)_2CH_2OC(=S)NH_2t$	H	3-I	2-Me-4-CF(CF ₃) ₂	
190	CH(Me)CH ₂ OP(=S)- (OMe) ₂	H	3-I	2-Me-4-OCF ₃	
191	CH(Me)CH ₂ OP(=S)- (OMe) ₂	H	H	2-Me-4-OCF ₃	
192	(CH ₂) ₃ OCONH ₂ t	H	3-I	2-Me-4-CF(CF ₃) ₂	
193	(CH ₂) ₃ OCONH ₂ t	H	3-I	2-Me-4-OCF ₃	
194	CH(Me)(CH ₂) ₂ OCONH ₂ t	H	3-I	2-Me-4-CF(CF ₃) ₂	
195	CH(Me)(CH ₂) ₂ OCO- N(Et) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	
196	CH(Me)(CH ₂) ₂ OCONH- CH ₂ -Ph	H	3-I	2-Me-4-CF(CF ₃) ₂	
197	$C(Me)_2(CH_2)_2OCONHMe$	H	3-I	2-Me-4-CF(CF ₃) ₂	
198	(CH ₂) ₄ OCONH ₂ t	H	3-I	2-Me-4-CF(CF ₃) ₂	76
199	(CH ₂) ₄ OCONHPr-i	H	3-I	2-Me-4-CF(CF ₃) ₂	132
200	CH(Me)(CH ₂) ₃ OCONH ₂ t	H	3-I	2-Me-4-CF(CF ₃) ₂	

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	Xn	Ym	Physical property: Melting point °C
201	CH(Me) (CH ₂) ₃ OCO- N(Et) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	
202	CH(Me) (CH ₂) ₃ OCONH- CH ₂ -Ph	H	3-I	2-Me-4-CF(CF ₃) ₂	
203	C(Me) ₂ (CH ₂) ₃ OCONHMe	H	3-I	2-Me-4-CF(CF ₃) ₂	
204	(CH ₂) ₅ OCONHET	H	H	2-Me-4-CF ₂ CF ₃	138
205	(CH ₂) ₅ OCONHET	H	H	2-Me-4-CF(CF ₃) ₂	136
206	CH(Me) (CH ₂) ₄ OCONHET	H	3-I	2-Me-4-CF(CF ₃) ₂	
207	CH(Me) (CH ₂) ₄ OCO- N(Et) ₂	H	3-I	2-Me-4-CF(CF ₃) ₂	
208	CH(Me) (CH ₂) ₄ OCONH- CH ₂ -Ph	H	3-I	2-Me-4-CF(CF ₃) ₂	
209	C(Me) ₂ (CH ₂) ₄ OCONHMe	H	3-I	2-Me-4-CF(CF ₃) ₂	
210	CH(Me) CH ₂ OCONHET	H	3-F	2-Me-4-CF(CF ₃) ₂	178
211	CH(Me) CH ₂ OCONHET	H	3-F	2-Me-4-OCF ₃	179
212	CH(Me) CH ₂ OCONHCH ₂ -Ph	H	3-F	2-Me-4-CF(CF ₃) ₂	131
213	C(Me) ₂ CH ₂ OCONHMe	H	3-F	2-Me-4-CF(CF ₃) ₂	
214	CH(Me) CH ₂ OCONHET	H	3-Cl	2-Me-4-CF(CF ₃) ₂	99
215	CH(Me) CH ₂ OCONHET	H	3-Cl	2-Me-4-CF ₂ CF ₃	145
216	CH(Me) CH ₂ OCONHET	H	3-Cl	2-Me-4-OCHF ₂	188
217	CH(Me) CH ₂ OCONHET	H	3-Cl	2-Me-4-OCF ₃	
218	CH(Me) CH ₂ OCONHCH ₂ -Ph	H	3-Cl	2-Me-4-CF(CF ₃) ₂	

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
219	$C(Me)_2CH_2OCONHMe$	H	3-Cl	2-Me-4-CF(CF ₃) ₂	164 196
220	$CH(Me)CH_2OCONHEt$	H	4-Cl	2-Me-4-CF(CF ₃) ₂	
221	$CH(Me)CH_2OCONHEt$	H	4-Cl	2-Me-4-OCF ₃	
222	$CH(Me)CH_2OCONHEt$	H	3-Br	2-Me-4-CF(CF ₃) ₂	
223	$CH(Me)CH_2OCONHEt$	H	3-Br	2-Me-4-OCF ₃	
224	$CH(Me)CH_2OCONHCH_2-Ph$	H	3-Br	2-Me-4-CF(CF ₃) ₂	139 193
225	$C(Me)_2CH_2OCONHMe$	H	3-Br	2-Me-4-CF(CF ₃) ₂	
226	$CH(Me)CH_2OCONHEt$	H	4-I	2-Me-4-CF(CF ₃) ₂	
227	$CH(Me)CH_2OCONHEt$	H	4-I	2-Me-4-OCF ₃	
228	$CH(Me)CH_2OCONHEt$	H	3,4- Cl ₂	2-Me-4-CF(CF ₃) ₂	
229	$CH(Me)CH_2OCONHCH_2-Ph$	H	3,4- Cl ₂	2-Me-4-CF(CF ₃) ₂	193
230	$CH(Me)CH_2OCONHEt$	H	3,4- Cl ₂	2-Me-4-OCF ₃	
231	$CH(Me)CH_2OCONHEt$	H	3-Br -4-Cl	2-Me-4-CF(CF ₃) ₂	
232	$CH(Me)CH_2OCONHEt$	H	3,4- Br ₂	2-Me-4-CF(CF ₃) ₂	
233	$CH(Me)CH_2OCONHEt$	H	3-I- 4-Cl	2-Me-4-CF(CF ₃) ₂	

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
234	CH(Me)CH ₂ OCONH ₂ t	H	3,4-I ₂	2-Me-4-CF(CF ₃) ₂	194
235	CH(Me)CH ₂ OCONH ₂ t	H	3-NO ₂	2-Me-4-CF(CF ₃) ₂	
236	CH(Me)CH ₂ OCONHCH ₂ -Ph	H	3-NO ₂	2-Me-4-OCF ₃	
237	CH(Me)CH ₂ OCON(Et) ₂	H	3-NO ₂	2-Me-4-CF(CF ₃) ₂	151
238	C(Me) ₂ CH ₂ OCONHMe	H	3-NO ₂	2-Me-4-CF(CF ₃) ₂	
239	CH(Me)CH ₂ OCONH ₂ t	H	3-CF ₃	2-Me-4-CF(CF ₃) ₂	
240	CH(Me)CH ₂ OCONHCH ₂ -Ph	H	3-CF ₃	2-Me-4-OCF ₃	178
241	CH(Me)CH ₂ OCON(Et) ₂	H	3-CF ₃	2-Me-4-CF(CF ₃) ₂	
242	C(Me) ₂ CH ₂ OCONHMe	H	3-CF ₃	2-Me-4-OCF ₃	
243	CH(Me)CH ₂ OCONH ₂ t	H	4-CF ₃	2-Me-4-CF(CF ₃) ₂	203
244	CH(Me)CH ₂ OCONH ₂ t	H	3-OCF ₃	2-Me-4-OCF ₃	
245	CH(Me)CH ₂ OCONHCH ₂ -Ph	H	3-OCF ₃	2-Me-4-CF(CF ₃) ₂	
246	CH(Me)CH ₂ OCON(Et) ₂	H	3-OCF ₃	2-Me-4-OCF ₃	182
247	C(Me) ₂ CH ₂ OCONHMe	H	3-OCF ₃	2-Me-4-CF(CF ₃) ₂	
248	CH(Me)CH ₂ OCONH ₂ t	H	3-SMe	2-Me-4-CF(CF ₃) ₂	
249	CH(Me)CH ₂ OCONH ₂ t	H	3-SOMe	2-Me-4-CF(CF ₃) ₂	
250	CH(Me)CH ₂ OCONH ₂ t	H	3-SO ₂ Me	2-Me-4-CF(CF ₃) ₂	
251	CH(Me)CH ₂ OCONH ₂ t	H	3-SCF ₃	2-Me-4-CF(CF ₃) ₂	
252	CH(Me)CH ₂ OCONH ₂ t	H	3-SOCF ₃	2-Me-4-CF(CF ₃) ₂	

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
253	CH (Me) CH ₂ OCONHET	H	3- SO ₂ CF ₃	2-Me-4-CF (CF ₃) ₂	
254	CH (Me) CH ₂ OCONHET	H	3- C≡CH	2-Me-4-CF (CF ₃) ₂	
255	CH (Me) CH ₂ OCONHET	H	3-C≡ C-Bu-t	2-Me-4-OCF ₃	
256	CH (Me) CH ₂ OCONHET	H	3-C≡ C-Ph	2-Me-4-CF (CF ₃) ₂	
257	CH (Me) CH ₂ OCONHET	H	3-C≡ C-CF ₃	2-Me-4-OCF ₃	
258	CH (Me) CH ₂ OCONHET	H	3-C≡ C-Si- (Me) ₃	2-Me-4-CF (CF ₃) ₂	
259	CH (Me) CH ₂ OCONHET	H	3-CH= CH-CH= CH-4	2-Me-4-CF (CF ₃) ₂	207
260	CH (Me) CH ₂ OCONHET	H	3-CH= CH-CH= CH-4	2-Me-4-OCF ₃	185
261	CH (Me) CH ₂ OCONHET	H	3-OCF ₂ -O-4	2-Me-4-CF (CF ₃) ₂	

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
262	CH(Me)CH ₂ OCONH ₂ t	H	3-OCF ₂ -CF ₂ O- 4	2-Me-4-CF(CF ₃) ₂	
263	CH(Me)CH ₂ OCONH ₂ t	H	3-I	2-Me-4-Cl	202
264	CH(Me)CH ₂ OCONH ₂ t	H	3-I	2-Me-4-Cl (R ³ =Me)	Paste
265	CH(Me)CH ₂ OCONH ₂ t	H	3-I	2-Me-4-CF ₃	217
266	CH(Me)CH ₂ OCONH ₂ t	H	3-I	2-Cl-4-CF ₃	208
267	CH(Me)CH ₂ OCONH ₂ t	H	3-I	2-Me-4-CF ₂ CF ₃	163
268	CH(Me)CH ₂ OCONHCH ₂ -Ph	H	3-I	2-Me-4-CF ₂ CF ₃	168
269	CH(Me)CH ₂ OCONH ₂ t	H	3-I	2-Et-4-CF ₂ CF ₃	179
270	CH(Me)CH ₂ OCONH ₂ t	H	3-I	2-F-4-CF ₂ CF ₃	176
271	CH(Me)CH ₂ OCONH ₂ t	H	3-I	2-Cl-4-CF ₂ CF ₃	184
272	CH(Me)CH ₂ OCONH ₂ t	H	3-I	2-Me-4-C ₃ F ₇ -n	173
273	CH(Me)CH ₂ OCONH ₂ t	H	3-I	2-Me-4-C ₄ F ₉ -n	
274	C(Me) ₂ CH ₂ OCONHMe	H	3-I	2-Cl-4-CF(CF ₃) ₂	140
275	CH(Me)CH ₂ OCONH ₂ t	H	3-I	2-OMe-4-CF(CF ₃) ₂	168
276	CH(Me)CH ₂ OCONH ₂ t	H	3-I	2-Me-4-CF(CF ₃)- CF ₂ CF ₃	
277	CH(Me)CH ₂ OCONH ₂ t	H	3-I	2-Me-3-F-4- CF(CF ₃) ₂	

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
278	CH (Me) CH ₂ OCONHEt	H	3-I	2-Me-3-OMe-4- CF (CF ₃) ₂	139
279	CH (Me) CH ₂ OCONHEt	H	3-I	2-Me-4-C (CF ₃) ₂ - OEt	193
280	CH (Me) CH ₂ OCONHEt	H	3-I	2-Br-4-OCF ₃	189
281	CH (Me) CH ₂ OCONHEt	H	3-I	2-Cl-4-OCF ₃	
282	CH (Me) CH ₂ OCONHEt	H	3-I	2-Me-4-OCF ₂ CF ₃	
283	CH (Me) CH ₂ OCONHEt	H	3-I	2-Me-4-OC ₃ F ₇ -n	
284	CH (Me) CH ₂ OCONHEt	H	3-I	2-Me-4-OCHF ₂	185
285	CH (Me) CH ₂ OCONHCH ₂ -Ph	H	H	2-Me-4-OCF ₂ CHF ₂	141
286	CH (Me) CH ₂ OCONHEt	H	3-I	2-Me-4-OCF ₂ CHClF	193
287	CH (Me) CH ₂ OCONHEt	H	3-I	2-Me-4-OCF ₂ CHF- CF ₃	182
288	CH (Me) CH ₂ OCONHEt	H	3-I	2-Me-4-OCF ₂ CHF- OCF ₃	168
289	CH (Me) CH ₂ OCONHEt	H	3-I	2-Me-4-O- (3-Cl-5 -CF ₃ -Pyr-2-yl)	200
290	CH (Me) CH ₂ OCONHEt	H	3-I	2-Me-4-SCF ₃	203
291	CH (Me) CH ₂ OCONHEt	H	3-I	2-Me-4-SOCF ₃	
292	CH (Me) CH ₂ OCONHEt	H	3-I	2-Me-4-SO ₂ CF ₃	
293	CH (Me) CH ₂ OCONHCH ₂ -Ph	H	H	3-OCF ₂ O-4	142
294	CH (Me) CH ₂ OCONHEt	H	3-I	3-OCF ₂ O-4	

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
295	CH (Me) CH ₂ OCONHEt	H	3-I	2-Me-3-OCF ₂ O-4	112
296	CH (Me) CH ₂ OCONHEt	H	3-I	2-Cl-3-OCF ₂ O-4	
297	CH (Me) CH ₂ OCONHEt	H	H	3-OCF ₂ CF ₂ O-4	
298	CH (Me) CH ₂ OCONHEt	H	3-I	3-CF ₂ CF ₂ O-4	
299	CH (Me) CH ₂ OCONHEt	H	3-I	3-OCF ₂ CF ₂ -4	
300	CH (Me) CH ₂ OCONHEt	H	3-I	3-CF ₂ CF ₂ CF ₂ -4	
301	CH (Me) CH ₂ OCONHEt	H	3-I	3-CF ₂ CF ₂ CF ₂ CF ₂ -4	
302	CH (Me) CH ₂ NHCHO	H	3-I	2-Me-4-CF (CF ₃) ₂	
303	C (Me) ₂ CH ₂ NHCHO	H	3-I	2-Me-4-CF (CF ₃) ₂	
304	CH (Me) (CH ₂) ₂ NHCHO	H	3-I	2-Me-4-CF (CF ₃) ₂	
305	C (Me) ₂ (CH ₂) ₂ NHCHO	H	3-I	2-Me-4-CF (CF ₃) ₂	
306	CH (Me) CH ₂ NHCOCF ₃	H	3-I	2-Me-4-CF (CF ₃) ₂	
307	C (Me) ₂ CH ₂ NHCOCF ₃	H	3-I	2-Me-4-CF (CF ₃) ₂	
308	C (Me) ₂ CH ₂ NHCOCF ₃	H	3-I	2-Me-4-OCF ₃	
309	(CH ₂) ₂ NHCOMe	Me	H	2-Me-4-CF (CF ₃) ₂	108
310	(CH ₂) ₂ NHCOCH ₂ -Ph	Me	H	2-Me-4-CF (CF ₃) ₂	191
311	(CH ₂) ₂ NHCO-Ph	Me	H	2-Me-4-CF (CF ₃) ₂	
312	CH (Me) CH ₂ NHC (=S) NHEt	H	H	2-Me-4-CF (CF ₃) ₂	185
313	C (Me) ₂ CH ₂ NHSO ₂ CF ₃	H	3-I	2-Me-4-CF (CF ₃) ₂	185
314	CH (Me) CH ₂ NHSO ₂ CF ₃	H	3-I	2-Me-4-CF (CF ₃) ₂	
315	C (Me) ₂ CH ₂ NHSO ₂ -Ph	H	3-I	2-Me-4-CF (CF ₃) ₂	
316	CH (Me) CH ₂ NHSO ₂ -Ph	H	3-I	2-Me-4-CF (CF ₃) ₂	

- Cont'd -

Table 1 (Cont'd)

No.	$-A^1-B-R^1$	R^2	X_n	Y_m	Physical property: Melting point °C
317	CH(Me)CH ₂ NH(Me)SO ₂ Me	H	3-I	2-Cl-4-CF(CF ₃) ₂	190
318	(CH ₂) ₂ N(Me)OMe	H	3-I	2-Me-4-CF(CF ₃) ₂	80
319	(CH ₂) ₃ N(Me)OMe	H	3-I	2-Me-4-CF(CF ₃) ₂	91
320	(CH ₂) ₃ N(Me)OMe	H	3-I	2-Me-4-OCF ₃	154
321	(CH ₂) ₂ NHCOMe	Me	H	2-Me-4-CF(CF ₃) ₂	187
322	C(Me) ₂ CH ₂ OCONHMe	H	3-I	2-Me-4-CF(CF ₃) ₂	180

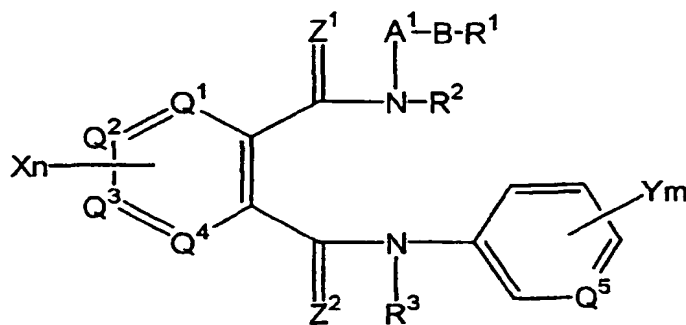


Table 2

(Z ¹ =Z ² =O, R ² =R ³ =H)									
No	$-A^1-B-R^1$	Q ¹	Q ²	Q ³	Q ⁴	Q ⁵	X_n	Y_m	Melting point °C
2-1	CH(Me)CH ₂ OCONHEt	N	C	C	C	C	3-Cl	2-Me-4-OCF ₃	85
2-2	CH(Me)CH ₂ OCON(Et) ₂	N	C	C	C	C	3-Cl	2-Me-4-CF ₂ CF ₃	
2-3	CH(Me)CH ₂ OCONHCH ₂ Ph	N	C	C	C	C	3-Cl	2-Me-4-CF ₂ CF ₃	
2-4	C(Me) ₂ CH ₂ OCONHMe	N	C	C	C	C	3-Cl	2-Me-4-CF(CF ₃) ₂	
2-5	CH(Me)CH ₂ OCONHEt	C	N	C	C	C	H	2-Me-4-CF(CF ₃) ₂	100
2-6	CH(Me)CH ₂ OCON(Et) ₂	C	N	C	C	C	3-Br	2-Me-4-CF ₃	

Table 2 (continued)

(Z ¹ =Z ² =O, R ² =R ³ =H)									
No	-A ¹ -B-R ¹	Q ¹	Q ²	Q ³	Q ⁴	Q ⁵	X _n	Y _m	Melting point °C
2-7	CH(Me) CH ₂ OCONHCH ₂ Ph	C	N	C	C	C	H	2-Cl-4-OCF ₃	94
2-8	C (Me) ₂ CH ₂ OCONHMe	C	N	C	C	C	H	2-Me-4-CF ₂ CF ₃	
2-9	CH (Me) CH ₂ OCONHEt	C	C	N	C	C	H	2-Me-4-OCF ₃	
2-10	CH(Me)CH ₂ OCON (Et) ₂	C	C	N	C	C	H	2-Me-4-CF ₂ CF ₃	
2-11	CH (Me) CH ₂ OCONHCH ₂ Ph	C	C	N	C	C	H	2-Me-4-CF(CF ₃) ₂	
2-12	C (Me) ₂ CH ₂ OCONHMe	C	C	N	C	C	H	2-Et-4-CF(CF ₃) ₂	
2-13	CH(Me) CH ₂ OCONHEt	C	C	C	N	C	H	2-Me-4-CF(CF ₃) ₂	
2-14	CH(Me)CH ₂ OCON (Et) ₂	C	C	C	N	C	H	2-Cl-4-CF ₃	
2-15	CH (Me) CH ₂ OCONHCH ₂ Ph	C	C	C	N	C	H	2-Me-4-OCF ₃	
2-16	C (Me) ₂ CH ₂ OCONHMe	C	C	C	N	C	3-I	2-Me-4-CF ₂ CF ₃	
2-17	CH(Me) CH ₂ OCONHEt	N	C	N	C	C	H	2-Me-4-OCF ₃	103
2-18	CH(Me)CH ₂ OCON (Et) ₂	N	C	C	N	C	H	2-Me-4-CF ₂ CF ₃	
2-19	C (Me) ₂ CH ₂ OCONHMe	C	N	C	N	C	H	2-Me-4-CF(CF ₃) ₂	
2-20	CH(Me) CH ₂ OCONHEt	C	C	C	C	N	3-I	2-Me-4-CF ₃	
2-21	CH(Me)CH ₂ OCON (Et) ₂	C	C	C	C	N	3-I	2-Cl-4-CF ₃	
2-22	CH(Me) CH ₂ OCONHCH ₂ Ph	C	C	C	C	N	3-I	2-Me-4-OCF ₃	
2-23	C (Me) ₂ CH ₂ OCONHMe	C	C	C	C	N	3-I	2-Cl-4-OCF ₃	
2-24	CH(Me) CH ₂ OCONHEt	C	C	C	C	N	3-I	4-CF ₂ CF ₃	
2-25	CH(Me)CH ₂ OCON (Et) ₂	C	C	C	C	N	3-I	2-Me-4-CF ₂ CF ₃	
2-26	CH(Me) CH ₂ OCONHCH ₂ Ph	C	C	C	C	N	3-I	2-Cl-4-CF ₂ CF ₃	
2-27	C (Me) ₂ CH ₂ OCONHMe	C	C	C	C	N	3-I	2-OMe-4-CF ₂ CF ₃	97
2-28	CH(Me)CH ₂ OCON (Et) ₂	C	C	C	C	N	3-I	4-CF(CF ₃) ₂	
2-29	CH(Me)CH ₂ OCON (Et) ₂	C	C	C	C	N	6-I	4-CF(CF ₃) ₂	
2-30	CH(Me) CH ₂ OCONHEt	C	C	C	C	N	3-Cl	2-Me-4-CF(CF ₃) ₂	
2-31	CH(Me) CH ₂ OCONHEt	C	C	C	C	N	-Br	2-Me-4-CF(CF ₃) ₂	119

Table 2 (continued)

(Z ¹ =Z ² =O, R ² =R ³ =H)									
No	-A ¹ -B-R ¹	Q ¹	Q ²	Q ³	Q ⁴	Q ⁵	X _n	Y _m	Melting point °C
2-32	CH(Me)CH ₂ OCON(Et) ₂	C	C	C	C	N	3-I	2-Me-4-CF(CF ₃) ₂	204
2-33	CH(Me)CH ₂ OCON(Et) ₂	C	C	C	C	N	6-I	2-Me-4-CF(CF ₃) ₂	140
2-34	CH(Me)CH ₂ OCONHCH ₂ Ph	C	C	C	C	N	3-I	2-Me-4-CF(CF ₃) ₂	176
2-35	C(Me) ₂ CH ₂ OCONHMe	C	C	C	C	N	3-I	2-Me-4-CF(CF ₃) ₂	
2-36	CH(Me)CH ₂ NHCO ₂ Et	C	C	C	C	N	3-I	2-Me-4-CF(CF ₃) ₂	
2-37	CH(Me)CH ₂ NHCOEt	C	C	C	C	N	3-I	2-Me-4-CF(CF ₃) ₂	
2-38	CH(Me)CH ₂ NHSO ₂ Et	C	C	C	C	N	3-I	2-Me-4-CF(CF ₃) ₂	188
2-39	CH(Me)CH ₂ OCONHEt	C	C	C	C	N	3-I	2-Cl-4-CF(CF ₃) ₂	
2-40	CH(Me)CH ₂ OCON(Et) ₂	C	C	C	C	N	3-I	2-Cl-4-CF(CF ₃) ₂	
2-41	CH(Me)CH ₂ OCONHCH ₂ Ph	C	C	C	C	N	3-I	2-Cl-4-CF(CF ₃) ₂	
2-42	C(Me) ₂ CH ₂ OCONHMe	C	C	C	C	N	3-I	2-Cl-4-CF(CF ₃) ₂	197
2-43	CH(Me)CH ₂ OCONHEt	C	C	C	C	N	3-I	2-OMe-4-CF(CF ₃) ₂	
2-44	CH(Me)CH ₂ OCON(Et) ₂	C	C	C	C	N	3-I	2-OMe-4-CF(CF ₃) ₂	
2-45	CH(Me)CH ₂ OCONHCH ₂ Ph	C	C	C	C	N	3-I	2-OMe-4-CF(CF ₃) ₂	
2-46	C(Me) ₂ CH ₂ OCONHMe	C	C	C	C	N	3-I	2-OMe-4-CF(CF ₃) ₂	222
2-47	CH(Me)CH ₂ OCONHEt	C	C	C	C	N	3-I	2-Me-4-OCH(CF ₃) ₂	
2-48	CH(Me)CH ₂ OCON(Et) ₂	C	C	C	C	N	H	2-Me-4-OCH(CF ₃) ₂	
2-49	CH(Me)CH ₂ OCON(Et) ₂	C	C	C	C	N	3-I	2-Me-4-OCH(CF ₃) ₂	
2-50	CH(Me)CH ₂ OCONHCH ₂ Ph	C	C	C	C	N	3-I	2-Me-4-OCH(CF ₃) ₂	210
2-51	C(Me) ₂ CH ₂ OCONHMe	C	C	C	C	N	3-I	2-Me-4-OCH(CF ₃) ₂	213
2-52	C(Me) ₂ CH ₂ OCONHMe	C	C	C	C	N	6-I	2-Me-4-OCH(CF ₃) ₂	222
2-53	CH(Me)CH ₂ NHCO ₂ Me	C	C	C	C	N	3-I	2-Me-4-OCH(CF ₃) ₂	
2-54	CH(Me)CH ₂ NHCOMe	C	C	C	C	N	3-I	2-Me-4-OCH(CF ₃) ₂	
2-55	CH(Me)CH ₂ NHSO ₂ N(Me) ₂	C	C	C	C	N	3-I	2-Me-4-OCH(CF ₃) ₂	
2-56	CH(Me)CH ₂ OCONHMe	C	C	C	C	N	3-I	2-Me-4-OCHF ₂	222
2-57	CH(Me)CH ₂ OCON(Et) ₂	C	C	C	C	N	3-I	2-Me-4-OCHF ₂	

Table 2 (continued)

(Z ¹ =Z ² =O, R ² =R ³ =H)									
No	-A ¹ -B-R ¹	Q ¹	Q ²	Q ³	Q ⁴	Q ⁵	Xn	Ym	Melting point °C
2-58	CH(Me) CH ₂ OCONHCH ₂ Ph	C	C	C	C	N	3-I	2-Me-4-OCHF ₂	
2-59	C (Me) ₂ CH ₂ OCONHMe	C	C	C	C	N	3-I	2-Me- 4-OCF ₂ CHF ₂	
2-60	CH(Me) CH ₂ OCONHEt	C	C	C	C	N	3-I	2-Me- 4-OCF ₂ CHF ₂	
2-61	CH(Me)CH ₂ OCON (Et) ₂	C	C	C	C	N	3-I	2-Me- 4-OCF ₂ CHF ₂	
2-62	CH(Me) CH ₂ OCONHCH ₂ Ph	C	C	C	C	N	3-I	2-Me- 4-OCF ₂ CHF ₂	
2-63	C (Me) ₂ CH ₂ OCONHMe	C	C	C	C	N	3-I	2-Me- 4-OCF ₂ CHF ₂	
2-64	CH(Me) CH ₂ OCONHEt	C	C	C	C	N	3-I	2-Me- 4-OCF ₂ CHF ₂	
2-65	CH(Me)CH ₂ OCON (Et) ₂	C	C	C	C	N	3-I	2-Me- 4-OCF ₂ CHF ₂	
2-66	CH(Me) CH ₂ OCONHCH ₂ Ph	C	C	C	C	N	3-I	2-Me- 4-OCF ₂ CHF ₂	
2-67	C (Me) ₂ CH ₂ OCONHMe	C	C	C	C	N	3-I	2-Me- 4-OCF ₂ CHF ₂	
2-68	CH(Me) CH ₂ OCONHEt	N	C	C	C	N	3-I	2-Me-4-OCF ₂	
2-69	CH(Me)CH ₂ OCON (Et) ₂	C	N	C	C	N	3-I	2-Me-4-CF ₂ CF ₃	
2-70	CH(Me) CH ₂ OCONHCH ₂ Ph	C	C	N	C	N	3-I	2-Me-4-CF(CF ₃) ₂	
2-71	C (Me) ₂ CH ₂ OCONHMe	C	C	C	N	N	3-I	2-Cl-4-CF(CF ₃) ₂	
2-72	CH (Me) CH ₂ OCONH -CH ₂ (4-(CMe)-Ph)	C	C	C	C	N	3-I	2-Me-4-OCH (CF ₃) ₂	201
2-73	CH(Me)CH ₂ OP(=S) -(OMe) ₂	C	C	C	C	N	3-I	2-Me-4-OCH (CF ₃) ₂	157
2-74	CH(Me)CH ₂ OP(=S) -(CMe) ₂	C	C	C	C	N	6-I	2-Me-4-OCH (CF ₃) ₂	134

[0036] Table 3 shows ¹H-NMR data of compounds having a physical property expressed by the word "amorphous" in Table 1.

Table 3

No.	¹ H-NMR[CDCl ₃ /TMS, δ values (ppm)]
80	1.33(d,3H), 2.37(s,3H), 3.91(dd,1H), 3.96(dd,1H), 4.55(m,1H), 6.32(d,1H), 6.78(d,2H), 6.94(dd,1H), 7.22(m,3H), 7.39(d,1H), 7.41(s,1H), 7.81(d,1H), 7.99(d,1H), 8.21(d,1H), 8.41(s,1H).
98	1.17(d,3H), 1.75-1.90(m,4H), 2.40(s,3H), 3.10-3.42(m,4H), 4.02(dd,1H), 4.22(dd,1H), 4.32(m,1H), 6.89(d,1H), 7.22(dd,1H), 7.42(s,1H), 7.44(d,1H), 7.81(d,1H), 7.97(d,1H), 8.34(d,1H), 8.48(s,1H).
117	1.26(dt,6H), 1.28(d,3H), 2.38(s,3H), 4.08(m,6H), 4.39(s,1H), 6.79(d,1H), 7.23(dd,1H), 7.41(s,1H), 7.43(d,1H), 7.81(d,1H), 7.99(d,1H), 8.31(d,1H), 8.42(s,1H).

[0037] Agricultural and horticultural chemicals, in particular, agricultural and horticultural insecticides, which contain as an active ingredient the aromatic diamide derivative of the general formula (I) or salt thereof of the present invention

are suitable for controlling various insect pests such as agricultural insect pests, forest insect pests, horticultural insect pests, stored grain insect pests, sanitary insect pests, nematodes, etc., which are injurious to paddy rice, fruit trees, vegetables, other crops, flowers and ornamental plants, and the like. They have a powerful insecticidal effect, for example, on LEPIDOPTERA including summer fruit tortrix (*Adoxophyes orana fasciata*), smaller tea tortrix (*Adoxophyes* sp.), Manchurian fruit moth (*Grapholita inopinata*), oriental fruit moth (*Grapholita molesta*), soybean pod borer (*Leguminivora glycinivorella*), mulberry leafroller (*Olethreutes mori*), tea leafroller (*Caloptilia thevivora*), *Caloptilia* sp. (*Caloptilia zachrysa*), apple leafminer (*Phyllonorycter ringoniella*), pear barkminer (*Spulerina astaurata*), common white (*Piers rapae crucivora*), tobacco budworm (*Heliothis* sp.), codling moth (*Laspeyresia pomonella*), diamondback moth (*Plutella xylostella*), apple fruit moth (*Argyresthia conjugella*), peach fruit moth (*Carposina niponensis*), rice stem borer (*Chilo suppressalis*), rice leafroller (*Cnaphalocrocis medinalis*), tobacco moth (*Ephestia elutella*), mulberry pyralid (*Glyphodes pyloalis*), yellow rice borer (*Scirpophaga incertulas*), rice skipper (*Parnara guttata*), rice armyworm (*Pseudaletia separata*), pink borer (*Sesamia inferens*), common cutworm (*Spodoptera litura*), beet armyworm (*Spodoptera exigua*), etc.; HEMIPTERA including aster leafhopper (*Macrosteles fascifrons*), green rice leafhopper (*Nephotettix cincticeps*), brown rice planthopper (*Nilaparvata lugens*), whitebacked rice planthopper (*Sogatella furcifera*), citrus psylla (*Diaphorina citri*), grape whitefly (*Aleurolobus taenabae*), sweetpotato whitefly (*Bemisia tabaci*), greenhouse whitefly (*Trialeurodes vaporariorum*), turnip aphid (*Lipaphis erysimi*), green peach aphid (*Myzus persicae*), Indian wax scale (*Ceroplastes ceriferus*), cottony citrus scale (*Pulvinaria aurantii*), camphor scale (*Pseudaonidia duplex*), San Jose scale (*Comstockaspis perniciosus*), arrowhead scale (*Unaspis yanonensis*), etc.; COLEOPTERA including root-lesion nematode (*Pratylenchus* sp.), soybean beetle (*Anomala rufocuprea*), Japanese beetle (*Popillia japonica*), tobacco beetle (*Lasioderma serricornis*), powderpost beetle (*Lyctus brunneus*), twenty-eight-spotted ladybird (*Epilachna vigintioctopunctata*), adzuki bean weevil (*Callosobruchus chinensis*), vegetable weevil (*Listroderes costirostris*), maize weevil (*Sitophilus zeamais*), boll weevil (*Anthonomus grandis grandis*), rice water weevil (*Lissorhoptrus oryzophilus*), cucurbit leaf beetle (*Aulacophora femoralis*), rice leaf beetle (*Oulema oryzae*), striped flea beetle (*Phyllotreta striolata*), pine shoot beetle (*Tomicus piniperda*), Colorado potato beetle (*Leptinotarsa decemlineata*), Mexican beetle (*Epilachna varivestis*), corn rootworm (*Diabrotica* sp.), etc.; DIPTERA including melon fly (*Dacus*(*Zeugodacus*) *cucurbitae*), oriental fruit fly (*Dacus*(*Bactrocera*) *dorsalis*), rice leafminer (*Agromyza oryzae*), onion maggot (*Delia antiqua*), seedcorn maggot (*Delia platura*), soybean pod gall midge (*Asphondylia* sp.), muscid fly (*Musca domestica*), house mosquito (*Culex pipiens pipiens*), etc.; and TYLENCHIDA including coffee root-lesion nematode (*Pratylenchus coffeae*), potato cyst nematode (*Globodera rostochiensis*), root-knot nematode (*Meloidogyne* sp.), citrus nematode (*Tylenchulus semipenetrans*), *Aphelenchus* sp. (*Aphelenchus avenae*), chrysanthemum foliar nematode (*Aphelenchoides rizemabosi*), etc.

[0038] The agricultural and horticultural chemical, in particular, agricultural and horticultural insecticide, which contains as an active ingredient the aromatic diamide derivative of the general formula (I) or salt thereof of the present invention has a marked insecticidal effect on the above-exemplified insect pests injurious to paddy field crops, upland crops, fruit trees, vegetables, other crops, flowers and ornamental plants, and the like. Therefore, the desired effect of the agricultural and horticultural chemical, in particular, agricultural and horticultural insecticide of the present invention can be obtained by applying the agricultural and horticultural chemical to the paddy field water, stalks and leaves of fruit trees, vegetables, other crops, flowers and ornamental plants, soil, etc., at a season at which the insect pests are expected to appear, before their appearance or at the time when their appearance is confirmed.

[0039] The agricultural and horticultural chemical of the present invention is generally prepared into conveniently usable forms according to an ordinary manner for preparation of agrochemicals.

[0040] That is, the aromatic diamide derivative of the general formula (I) or a salt thereof and, optionally, an adjuvant are blended with a suitable inert carrier in a proper proportion and prepared into a suitable preparation form such as a suspension, emulsifiable concentrate, soluble concentrate, wettable powder, granules, dust, tablets or the like through dissolution, dispersion, suspension, mixing, impregnation, adsorption or sticking.

[0041] The inert carrier usable in the present invention may be either solid or liquid. As a material usable as the solid carrier, there can be exemplified soybean flour, cereal flour, wood flour, bark flour, saw dust, powdered tobacco stalks, powdered walnut shells, bran, powdered cellulose, extraction residue of vegetables, powdered synthetic polymers or resins, clays (e.g. kaolin, bentonite, and acid clay), talcs (e.g. talc and pyrophyllite), silica powders or flakes (e.g. diatomaceous earth, silica sand, mica and white carbon [synthetic, high-dispersion silicic acid, also called finely divided hydrated silica or hydrated silicic acid, some of commercially available products contain calcium silicate as the major component]), activated carbon, powdered sulfur, pumice, calcined diatomaceous earth, ground brick, fly ash, sand, calcium carbonate, calcium phosphate and other inorganic or mineral powders, chemical fertilizers (e.g. ammonium sulfate, ammonium phosphate, ammonium nitrate, urea and ammonium chloride), and compost. These carriers may be used alone or as a mixture thereof.

[0042] A material usable as the liquid carrier is selected from materials that have solubility in themselves or which are without such solubility but are capable of dispersing an active ingredient with the aid of an adjuvant. The following are typical examples of the liquid carrier and can be used alone or as a mixture thereof: water, alcohols (e.g. methanol, ethanol, isopropanol, butanol and ethylene glycol), ketones (e.g. acetone, methyl ethyl ketone, methyl isobutyl ketone,

diisobutyl ketone and cyclohexanone), ethers (e.g. ethyl ether, dioxane, Cellosolve, dipropyl ether and tetrahydrofuran), aliphatic hydrocarbon (e.g. kerosene and mineral oils), aromatic hydrocarbons (e.g. benzene, toluene, xylene, solvent naphtha and alkylnaphthalenes), halogenated hydrocarbons (e.g. dichloroethane, chloroform, carbon tetrachloride and chlorobenzene), esters (e.g. ethyl acetate, diisopropyl phthalate, dibutyl phthalate and dioctyl phthalate), amides (e.g. dimethylformamide, diethylformamide and dimethylacetamide), nitriles (e.g. acetonitrile), and dimethyl sulfoxide.

[0043] The following are typical examples of the adjuvant, which are used depending upon purposes and used alone or in combination in some cases, or need not to be used at all.

[0044] To emulsify, disperse, dissolve and/or wet a compound as active ingredient, a surfactant is used. As the surfactant, there can be exemplified polyoxyethylene alkyl ethers, polyoxyethylene alkylaryl ethers, polyoxyethylene higher fatty acid esters, polyoxyethylene resonates, polyoxyethylene sorbitan monolaurate, polyoxyethylene sorbitan monooleate, alkylarylsulfonates, naphthalene sulfonic acid condensation products, ligninsulfonates and higher alcohol sulfate esters.

[0045] Further, to stabilize the dispersion of a compound as active ingredient, tackify it and/or bind it, the adjuvants exemplified below may also be used, namely, there may also be used adjuvants such as casein, gelatin, starch, methyl cellulose, carboxymethyl cellulose, gum arabic, poly(vinyl alcohol)s, turpentine, bran oil, bentonite and ligninsulfonates.

[0046] To improve the flowability of a solid product, the following adjuvants may also be used, namely, there may be used adjuvants such as waxes, stearates, alkyl phosphates, etc.

[0047] Adjuvants such as naphthalenesulfonic acid condensation products and polycondensates of phosphates may be used as a peptizer for dispersible products.

[0048] Adjuvants such as silicone oils may also be used as a defoaming agent.

[0049] The content of the compound as active ingredient may be varied as required, and the compound as active ingredient may be used in a proportion properly chosen in the range of 0.01 to 90 parts by weight per 100 parts of the agricultural and horticultural insecticide. For example, in dusts or granules, the suitable content of the compound as active ingredient is from 0.01 to 50 % by weight. In emulsifiable concentrates or flowable wettable powders, it is also from 0.01 to 50 % by weight.

[0050] The agricultural and horticultural chemical, in particular, agricultural and horticultural insecticide of the present invention is used to control a variety of insect pests in the following manner: it is applied to a crop on which the insect pests are expected to appear, or a site where appearance or growth of the insect pests is undesirable, as it is or after being properly diluted with or suspended in water or the like, in an amount effective for control of the insect pests.

[0051] The applying dosage of the agricultural and horticultural insecticide of the present invention is varied depending upon various factors such as a purpose, insect pests to be controlled, a growth state of a plant, tendency of insect pests appearance, weather, environmental conditions, a preparation form, an application method, an application site and application time. It may be properly chosen in the range of 0.001 g to 10 kg, preferably 0.01 g to 1 kg, (in terms of the compound as active ingredient) per 10 ares depending upon purposes.

[0052] The agricultural and horticultural chemical, in particular, agricultural and horticultural insecticide of the present invention may be used in admixture with other agricultural and horticultural insecticides, acaricides, nematocides, fungicides, biotic pesticides or the like in order to expand both spectrum of controllable insect pest species and the period of time when effective application are possible or to reduce the dosage. Furthermore, the agricultural and horticultural chemical of the present invention may be used in admixture with herbicides, plant growth regulators, fertilizers or the like, depending upon application situations.

[0053] As the other agricultural and horticultural insecticides, acaricides and nematocides, which are used for the above purpose, there can be exemplified agricultural and horticultural insecticides, acaricides and nematocides, such as Ethion, Trichlorfon, Metamidophos, Acephate, Dichlorvos, Mevinphos, Monocrotophos, Malathion, Dimethoate, Formothion, Mecarbam, Vamidothion, Thiometon, Disulfoton, Oxydeprofos, Naled, Methylpatathion, Fenitrothion, Cyanophos, Propaphos, Fenthion, Prothiofos, Profenofos, Isofenphos, Temephos, Phenthoate, Dimethylvinphos, Chlorfenvinphos, Tetrachlorvinphos, Phoxim, Isoxathion, Pyraclofos, Methidathion, Chlorpyrifos, Chlorpyrifos-methyl, Pyridaphenthion, Diazinon, Pirimiphosmethyl, Phosalone, Phosmet, Dioxabenzophos, Quinalphos, Terbufos, Ethoprophos, Cadusafos, Mesulfenfos, DPS (NK-0795), Phosphocarb, Fenamiphos, Isoamidophos, Fosthiazate, Isazophos, Ethoprophos, Fostietane, Dichlofenthion, Thionazin, Sulprofos, Fensulfothion, Diamidafos, Pyrethrin, Allethrin, Prallethrin, Resmethrin, Permethrin, Tefluthrin, Bifenthrin, Fenpropathrin, Cypermethrin, α -Cypermethrin, Cyhalothrin, λ -Cyhalothrin, Deltamethrin, Acrinathrin, Fenvalerate, Esfenvalerate, Flucythrinate, Fluvalinate, Cycloprothrin, Ethofenprox, Halfenprox, Silafluofen, Fluvalinate, Methomyl, Oxamyl, Thiodicarb, Aldicarb, Alanycarb, Cartap, Metolcarb, Xylcarb, Propoxur, Phenoxycarb, Fenobucarb, Ethiofencarb, Fenothiocarb, Bifenazate, BPMC, Carbaryl, Pirimicarb, Carbofuran, Carbosulfan, Furathiocarb, Benfuracarb, Aldoxycarb, Diafenthion, Diflubenzuron, Teflubenzuron, Hexaflumuron, Novaluron, Lufenuron, Flufenoxuron, Chlorfluazuron, Fenbutatin oxide, tricyclohexyltin hydroxide, sodium oleate, potassium oleate, Methoprene, Hydroprene, Binapacryl, Amitraz, Dicofol, Chloro-benzilate, Bromopropylate, Tetradifon, Bensultap, Benzoximate, Tebufenozide, Methoxyfenozide, Chromafenozide, Propargite, Acequinosyl, Endosulfan, Diofenolan, Chlorfenapyr, Fenpyroximate, Tolfenpyrad, Fipronil, Tebufenpyrad, Triazamate, Etoxazole, Hex-

ythiazox, nicotine sulfate, Nitenpyram, Acetamiprid, Thiocloprid, Imidacloprid, Thiamethoxam, Clothianidin, Nidinotefuran, Fluzinam, Pyriproxyfen, Hydramethylnon, Pyrimidifen, Pyridaben, Cyromazin, TPIC (tripropyl isocyanurate), Pymetrozin, Clofentezin, Buprofedine, Thiocyclam, Fenazaquin, Chinomethionate, Indoxacarb, Polynactin complexes, Milbemectin, Abamectin, Emamectin-benzoate, Spinosad, BT (*Bacillus thuringiensis*), Azadirachtin, Rotenone, hydroxypropyl starch, Levamisole hydrochloride, Metam-sodium, Morantel tartrate, Dazomet, Trichlamide, *Pasteuria penetrans*, *Monacrosporium phymatophagum*, etc. As the agricultural and horticultural fungicides used for the same purpose as above, there can be exemplified agricultural and horticultural fungicides such as sulfur, lime sulfur, copper sulfate basic, Iprobenfos, Edifenfos, Tolclofos-methyl, Thiram, Polycarbamate, Zineb, Maneb, Mancozeb, Propineb, Thiophanate, Thiophanate methyl, Benomyl, Iminoctadin acetate, Iminocutadin albexylate, Mepronil, Flutolanil, Pencycuron, Furametpyl, Thifluzamide, Metalaxyl, Oxadixyl, Carpropamid, Dichlofluanid, Flusulfamide, Chlorothalonil, Kresoxim-methyl, Fenoxanil (NNF-9425), Himexazol, Etridiazol, Fluoroimide, Procymidone, Vinclozolin, Iprodione, Triadimefon, Triflumizole, Bitertanol, Ipconazole, Fluconazole, Propiconazole, Diphenconazole, Myclobutanil, Tetraconazole, Hexaconazole, Tebuconazole, Imibenconazole, Prochloraz, Pefurazoate, Cyproconazole, Isoprothiolane, Fenarimol, Pyrimetanil, Mepanipyrim, Pyrifenoxy, Fluazinam, Triforine, Diclomezine, Azoxystrobin, Thiadiazin, Captan, Probenazole, Acibenzolar-S-methyl (CGA-245704), Fthalide, Tricyclazole, Pyroquilon, Chinomethionate, Oxolinic acid, Dithianon, Kasugamycin, Validamycin, Polyoxin, Blasticidin, Streptomycin, etc. Similarly, as the herbicides, there can be exemplified herbicides such as Glyphosate, Sulfosate, Glyphosinate, Bialaphos, Butamifos, Esprocarb, Prosulcarb, Benthiocarb, Pyributycarb, Asulam, Linuron, Dymron, Bensulfuron methyl, Cyclosulfamuron, Cinosulfuron, Pyrazosulfuron ethyl, Azimsulfuron, Imazosulfuron, Tenylchlor, Alachlor, Pretilachlor, Clomeprop, Etobenzanil, Mefenacet, Pendimethalin, Bifenox, Acifluorfen, Lactfen, Cyhalofop-butyl, Ioxynil, Bromobutide, Alloxym, Setoxydim, Napropamide, Indanofan, Pyrazolate, Benzofenap, Pyraflufen-ethyl, Imazapyr, Sulfentrazone, Cafenstrole, Bentoxazon, Oxadiazon, Paraquat, Diquat, Pyriminobac, Simazine, Atrazine, Dimethametryn, Triaziflam, Benflesate, Flutiacet-methyl, Quizalofop-ethyl, Bentazon, calcium peroxide, etc.

[0054] As to the biotic pesticides, the same effect as above can be expected by using the agricultural and horticultural chemical of the present invention in admixture with, for example, viral formulations obtained from nuclear polyhedrosis virus (NPV), granulosis virus (GV), cytoplasmic polyhedrosis virus (CPV), entomopox virus (EPV), etc.; microbial pesticides utilized as insecticides or nematocides, such as *Monacrosporium phymatophagum*, *Steinernema carpocapsae*, *Steinernema kushidai*, *Pasteuria penetrans*, etc.; microbial pesticides utilized as fungicides, such as *Trichoderma lignorum*, *Agrobacterium radiobacter*, nonpathogenic *Erwinia carotovora*, *Bacillus subtilis*, etc.; and biotic pesticides utilized as herbicides, such as *Xanthomonas campestris*, etc.

[0055] In addition, the agricultural and horticultural chemical of the present invention can be used in combination with biotic pesticides including natural enemies such as Parasitic wasp (*Encarsia formosa*), Parasitic wasp (*Aphidius colemani*), Gall-midge (*Aphidoletes aphidimyza*), Parasitic wasp (*Diglyphus isaea*), Parasitic mite (*Dacnusa sibirica*), Predatory mite (*Phytoseiulus persimilis*), Predatory mite (*Amblyseius cucumeris*), Predatory bug (*Orius sauteri*), etc.; microbial pesticides such as *Beauveria brongniartii*, etc.; and pheromones such as (Z)-10-tetradecenyl=acetate-(E,Z)-4,10-tetradecadienyl=acetate-(Z)-8-dodecenyl=acetate-(Z)-11-tetradecenyl=acetate-(Z)-13-icosen-10-one, (Z)-8-dodecenyl=acetate-(Z)-11-tetradecenyl=acetate-(Z)-13-icosen-10-one-14-methyl-1-octadecene, etc.

[0056] Typical examples of the present invention are described below but they should not be construed as limiting the scope of the invention.

EXAMPLES

Production Example 1

(1-1). Production of 3-iodo-N-(4-heptafluoroisopropyl-2-methylphenyl)phthalamic acid

[0057] A solution of 3.5 g of 4-heptafluoro-isopropyl-2-methylaniline in 3 ml of acetonitrile was slowly dropped into a suspension of 3.5 g of 1-iodophthalic anhydride in 30 ml of acetonitrile under ice-cooling. After completion of the dropwise addition, the reaction was carried out with stirring at room temperature for 3 hours. After completion of the reaction, the crystals precipitated were collected by filtration and washed with a small volume of acetonitrile to obtain 4.0 g of the desired compound.

[0058] Physical property: m.p. 174 - 181°C. Yield: 57%.

(1-2). Production of 3-iodo-N-(4-heptafluoroisopropyl-2-methylphenyl)phthalisoimide

[0059] To a suspension of 2.0 g of 3-iodo-N-(4-heptafluoroisopropyl-2-methylphenyl)phthalamic acid in 10 ml of toluene was added 1.1 g of trifluoroacetic anhydride, and the reaction was carried out with stirring at room temperature for 30 minutes. After completion of the reaction, the solvent was distilled off under reduced pressure to obtain 2.0 g of

a crude product as the desired product. The desired product obtained was used in the subsequent reaction without purification.

[0060] ¹H-NMR [CDCl₃/TMS, δ values (ppm)]

2.4(s, 3H), 7.3(d, 1H), 7.4(m, 2H), 7.5(t, 1H), 8.1(d, 1H), 8.2(d, 1H)

(1-3). Production of 3-iodo-N¹-(4-heptafluoroisopropyl-2-methylphenyl)-N²-[1-methyl-2-(N,N-dimethyl sulfamoylamino)ethyl]phthalamide (compound No. 45)

[0061] In 30 ml of acetonitrile was dissolved 0.4 g of 3-iodo-N-(4-heptafluoroisopropyl-2-methylphenyl)-phthalisoimide, followed by adding thereto 0.2 g of N,N-dimethylamino-N'-(2-aminopropyl)sulfonamide, and the resulting mixture was stirred at room temperature for 5 hours. After completion of the reaction, the reaction mixture was poured into ice water, followed by extraction with ethyl acetate. The organic layer was washed with an aqueous sodium chloride solution, dried over anhydrous magnesium sulfate and then distilled under reduced pressure to remove the solvent, and the resulting residue was purified by silica gel column chromatography to obtain 0.2 g of the desired compound.

[0062] Physical property: m.p. 95°C. Yield: 40%.

Production Example 2

Production of 3-iodo-N¹-(4-heptafluoroisopropyl-2-methylphenyl)-N²-[1-methyl-2-(ethylaminocarbonyloxy)ethyl]phthalamide (compound No. 96)

[0063] In 30 ml of acetonitrile was dissolved 0.55 g of 6-iodo-N-[1-methyl-2-(ethylaminocarbonyloxy)ethyl]-phthalisoimide, followed by adding thereto 0.38 g of 4-heptafluoroisopropyl-2-methylaniline, and the resulting mixture was stirred at room temperature for 3 hours. After completion of the reaction, the reaction mixture was poured into ice water, followed by extraction with ethyl acetate. The organic layer was washed with an aqueous sodium chloride solution, dried over anhydrous magnesium sulfate and then distilled under reduced pressure to remove the solvent, and the resulting residue was purified by silica gel column chromatography to obtain 0.36 g of the desired compound.

[0064] Physical property: m.p. 185°C. Yield: 38%.

Production Example 3

(3-1). Production of 3-iodo-N-(4-heptafluoroisopropyl-2-methylphenyl)phthalimide

[0065] To a suspension of 2.7 g of 3-iodophthalic anhydride in 30 ml of acetic acid was added 2.7 g of 4-heptafluoroisopropyl-2-methylaniline, and the resulting mixture was heated under reflux for 3 hours.

[0066] After completion of the reaction, the solvent was distilled off under reduced pressure from the reaction mixture, and the resulting residue was purified by silica gel column chromatography to obtain 4.8 g of the desired compound.

[0067] Yield: 89%.

(3-2). Production of 3-iodo-N¹-(4-heptafluoroisopropyl-2-methylphenyl)-N²-[3-t-butoxycarbonyl aminopropyl]phthalamide (compound No. 20)

[0068] In 20 ml of dioxane was dissolved 0.5 g of 3-iodo-N-(4-heptafluoroisopropyl-2-methylphenyl)-phthalimide, followed by adding thereto 0.25 g of t-butyl N-(3-aminopropyl)carbamate and two drops of trifluoroacetic acid, and the resulting mixture was stirred at room temperature for 10 hours. After completion of the reaction, the reaction mixture was poured into ice water, followed by extraction with ethyl acetate. The organic layer was washed with an aqueous sodium chloride solution, dried over anhydrous magnesium sulfate and then distilled under reduced pressure to remove the solvent, and the resulting residue was purified by silica gel column chromatography to obtain 0.2 g of the desired compound.

[0069] Physical property: m.p. 145°C. Yield: 30%.

[0070] Typical formulation examples and test examples of the present invention are described below but they should not be construed as limiting the scope of the invention.

[0071] In the formulation examples, parts are all by weight.

Formulation Example 1

[0072]

Each compound listed in Table 1 or Table 2	50 parts
Xylene	40 parts
Mixture of polyoxyethylene nonylphenyl ether and calcium alkylbenzenesulfonate	10 parts

[0073] An emulsifiable concentrate was prepared by mixing uniformly the above ingredients to effect dissolution.

Formulation Example 2

[0074]

Each compound listed in Table 1 or Table 2	3 parts
Clay powder	82 parts
Diatomaceous earth powder	15 parts

[0075] A dust was prepared by mixing uniformly and grinding the above ingredients.

Formulation Example 3

[0076]

Each compound listed in Table 1 or Table 2	5 parts
Mixed powder of bentonite and clay	90 parts
Calcium lignin sulfonate	5 parts

[0077] Granules were prepared by mixing the above ingredients uniformly, and kneading the resulting mixture together with a suitable amount of water, followed by granulation and drying.

Formulation Example 4

[0078]

Each compound listed in Table 1 or Table 2	20 parts
Mixture of kaolin and synthetic, high-dispersion silicic acid	75 parts
Mixture of polyoxyethylene nonylphenyl ether and calcium alkylbenzenesulfonate	5 parts

[0079] A wettable powder was prepared by mixing uniformly and grinding the above ingredients.

Test Example 1

Insecticidal effect on diamondback moth (*Plutella xylostella*)

[0080] Adult diamondback moths were released and allowed to oviposit on a Chinese cabbage seedling. Two days after the release, the seedling having eggs deposited thereon was immersed for about 30 seconds in a liquid chemical prepared by diluting a preparation containing each compound listed in Table 1 or Table 2, as an active ingredient to adjust the concentration to 50 ppm. After air-drying, the seedling was allowed to stand in a room thermostated at 25°C.

[0081] Six days after the immersion in the liquid chemical, the hatched insects were counted and the mortality was calculated according to the following equation, whereby the insecticidal effect was judged according to the criterion shown below. The test was carried out with three replications of 10 insects.

$$\text{Corrected mortality (\%)} = \frac{\left[\begin{array}{c} \text{Number of} \\ \text{hatched insects} \\ \text{in untreated} \\ \text{group} \end{array} \right] - \left[\begin{array}{c} \text{Number of} \\ \text{hatched insects} \\ \text{in treated} \\ \text{group} \end{array} \right]}{\left[\begin{array}{c} \text{Number of} \\ \text{hatched insects in} \\ \text{untreated group} \end{array} \right]} \times 100$$

Criterion for judgment

[0082]

- A --- mortality 100%
- B --- mortality 99% to 90%
- C --- mortality 89% to 80%
- D --- mortality 79% to 50%

[0083] As a result of the above test, it was found that the following compounds had an insecticidal activity rated B or higher: compound Nos. 1 to 122, 127 to 130, 133 to 136, 139, 140, 142 to 145, 148, 149, 152, 153, 157, 161, 165, 167 to 173, 182 to 185, 194, 198, 199, 204, 205, 210 to 212, 214 to 216, 222, 223, 229, 230, 235, 236, 243, 247, 259, 260, 263 to 272, 274, 275, 278 to 280, 284 to 290, 293, 297, 308, 311, 312, 317 to 322, 2-3, 2-5, 2-11, 2-13, 2-28, 2-29, 2-32, 2-33, 2-35, 2-39, 2-47 to 2-52, 2-72, 2-73 and 2-74.

Test Example 2

Insecticidal effect on common cutworm (*Spodoptera litura*)

[0084] A piece of cabbage leaf (cultivar: Shikidori) was immersed for about 30 seconds in a liquid chemical prepared by diluting a preparation containing each compound listed in Table 1 or Table 2, as an active ingredient to adjust the concentration to 50 ppm. After air-drying, the piece was placed in a plastic Petri dish with a diameter of 9 cm and inoculated with second-instar larvae of common cutworm, after which the dish was closed and then allowed to stand in a room thermostated at 25°C. Eight days after the inoculation, the dead and alive were counted and the mortality was calculated according to the following equation, whereby the insecticidal effect was judged according to the criterion shown in Test Example 1. The test was carried out with three replications of 10 insects.

$$\text{Corrected mortality (\%)} = \frac{\left[\begin{array}{c} \text{Number of} \\ \text{alive insects} \\ \text{in untreated} \\ \text{group} \end{array} \right] - \left[\begin{array}{c} \text{Number of} \\ \text{alive insects} \\ \text{in treated} \\ \text{group} \end{array} \right]}{\left[\begin{array}{c} \text{Number of} \\ \text{alive insects in} \\ \text{untreated group} \end{array} \right]} \times 100$$

[0085] As a result of the above test, it was found that the following compounds had an activity rated B or higher: compound Nos. 1, 2, 6 to 9, 12 to 16, 19, 22, 28, 29, 33 to 36, 38 to 45, 48, 50, 51, 54 to 57, 59, 62 to 72, 74, 76 to 78, 81 to 86, 88, 90 to 113, 116, 117, 129, 130, 133, 134, 139, 142, 144, 148, 152, 153, 172, 184, 229, 247, 272, 274, 279, 286, 287, 289, 290, 2-32, 2-35, 2-39, 2-47, 2-49 to 2-51, 2-72 and 2-73.

Test Example 3

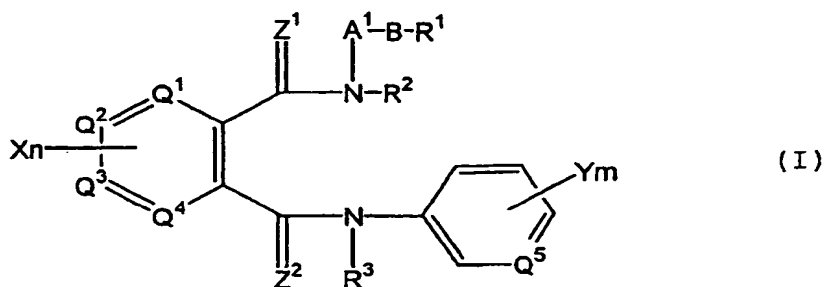
Insecticidal effect on smaller tea tortrix (*Adoxophyes* sp.)

[0086] Tea leaves were immersed for about 30 seconds in a liquid chemical prepared by diluting a preparation containing each compound listed in Table 1 or Table 2, as an active ingredient to adjust the concentration to 50 ppm. After air-drying, the tea leaves were placed in a plastic Petri dish with a diameter of 9 cm and inoculated with larvae of smaller tea tortrix, after which the dish was allowed to stand in a room thermostated at 25°C and having a humidity of 70%. Eight days after the inoculation, the dead and alive were counted and the insecticidal effect was judged according to the criterion shown in Test Example 1. The test was carried out with three replications of 10 insects.

[0087] As a result of the above test, it was found that the following compounds had an activity rated B or higher: compound Nos. 1 to 4, 6 to 10, 12 to 16, 19 to 26, 28 to 45, 48 to 51, 54 to 60, 62 to 72, 74 to 78, 80 to 117, 129, 130, 133 to 136, 139, 140, 142, 144, 145, 148, 149, 152, 153, 170, 182, 184, 210, 247, 265, 272, 274, 279, 284, 286, 287, 289, 290, 317, 322, 2-32, 2-35, 2-39, 2-47, 2-49 to 2-51, 2-72 and 2-73.

Claims

1. An aromatic diamide derivative represented by the general formula (I):



(wherein A¹ is a (C₁-C₈)alkylene group; a substituted (C₁-C₈)alkylene group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, (C₁-C₆)alkylthio(C₁-C₆)alkyl groups, (C₁-C₆)alkoxycarbonyl groups and phenyl group; a (C₃-C₈)alkenylene group; a substituted (C₃-C₈)alkenylene group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, (C₁-C₆)alkylthio(C₁-C₆)alkyl groups, (C₁-C₆)alkoxycarbonyl groups and phenyl group; a (C₃-C₈)alkynylene group; or a substituted (C₃-C₈)alkynylene group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, (C₁-C₆)alkylthio (C₁-C₆)alkyl groups, (C₁-C₆)alkoxycarbonyl groups and phenyl group,

any of the saturated carbon atoms in the above-mentioned (C₁-C₈)alkylene group, substituted (C₁-C₈)alkylene group, (C₃-C₈)alkenylene group, substituted (C₃-C₈)alkenylene group, (C₃-C₈)alkynylene group or substituted (C₃-C₈)alkynylene group being able to have a (C₂-C₅)alkylene group bonded thereto as a substituent, to form a (C₃-C₆)cycloalkane ring, and any two of the carbon atoms in the above-mentioned (C₁-C₈)alkylene group, substituted (C₁-C₈)alkylene group, (C₃-C₈)alkenylene group and substituted (C₃-C₈)alkenylene group being able to form a (C₃-C₆)cycloalkane ring or a (C₃-C₆)cycloalkene ring together with an alkylene group or an alkenylene group,

B is -O- or -N(R⁴)- (wherein R⁴ is a hydrogen atom; a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₃-C₆)alkenyl group; a halo (C₃-C₆) alkenyl group; a (C₃-C₆)alkynyl group; a (C₃-C₆)cycloalkyl group; a (C₁-C₆)

[illegible]

alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups, further, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); -C(=W¹)-N(R⁵)(R⁶) (wherein W¹, R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, and R⁵ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); -C(=W¹)-R⁵ (wherein W¹ and R⁵ are as defined above); -C(=W¹)-W¹-R⁷ (wherein W¹s, which may be the same or different, are as defined above, and R⁷ is a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₁-C₄)alkoxy(C₁-C₄)alkyl group; a (C₁-C₄)alkylthio(C₁-C₄)alkyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfanyl groups, halo (C₁-C₆)alkylsulfanyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyl (C₁-C₄)alkyl group; a substituted phenyl(C₁-C₄)alkyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfanyl groups, halo(C₁-C₆)alkylsulfanyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; or a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfanyl groups, halo (C₁-C₆)alkylsulfanyl groups, (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups); -SO₂-R⁷ (wherein R⁷ is as defined above); -SO₂-N(R⁵)(R⁶) (wherein R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, and R⁵ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain three or four atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); -N(R⁵)(R⁶) (wherein R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, and R⁵ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); or -N=C(R⁵)R⁶ (wherein R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); in the case of B being -N(R⁴)-, R¹ being able to be -OR⁵ (wherein R⁵ is as defined above), -C(W²)-N(R⁵)R⁶ (wherein W² is =CH-NO₂, =N-NO₂ or =N-CN, and R⁵ and R⁶ are as defined above, R⁵ or R⁶ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring) or -C(W²)-W¹-R⁷ (wherein W¹, W² and R⁷ are as defined above, R⁷ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring), and R¹ being able to bind to A¹ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, each of R² and R³, which may be the same or different, is a hydrogen atom, a (C₃-C₆)cycloalkyl group or -A²-R⁸ (wherein A² is -C(=O)-, -C(=S)-, -C(=NR⁹)- (wherein R⁹ is a hydrogen atom, a (C₁-C₆)alkyl group, a (C₁-C₆)alkoxy group, a mono(C₁-C₆)alkylamino group, a di(C₁-C₆)alkylamino group whose (C₁-C₆)alkyl groups may be the same or different, a (C₁-C₆)alkoxycarbonyl group, a phenyl group, or a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano

group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups), a (C₁-C₈)alkylene group, a halo (C₁-C₈)alkylene group, a (C₃-C₆)alkenylene group, a halo (C₃-C₆)alkenylene group, a (C₃-C₆)alkynylene group or a halo(C₃-C₆)alkynylene group,

(1) in the case of A² being -C(=O)-, -C(=S)- or -C(=NR⁹)- (wherein R⁹ is as defined above), R⁸ is a hydrogen atom; a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; or -A³-R¹⁰ (wherein A³ is -O-, -S- or -N(R¹¹)- (wherein R¹¹ is a hydrogen atom; a (C₁-C₆)alkylcarbonyl group; a halo(C₁-C₆)alkylcarbonyl group; a (C₁-C₆)alkoxycarbonyl group; a phenylcarbonyl group; a substituted phenylcarbonyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyl(C₁-C₄)alkoxycarbonyl group; or a substituted phenyl(C₁-C₄)alkoxycarbonyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups), and R¹⁰ is a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₃-C₆)alkenyl group; a halo(C₃-C₆)alkenyl group; a (C₃-C₆)alkynyl group; a halo(C₃-C₆)alkynyl group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a (C₁-C₆)alkylcarbonyl group; a halo (C₁-C₆)alkylcarbonyl group; a (C₁-C₆)alkoxycarbonyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyl (C₁-C₄)alkyl group; a substituted phenyl(C₁-C₄)alkyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups); a heterocyclic group; or a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups),

(2) in the case of A² being a (C₁-C₈)alkylene group, a halo(C₁-C₈)alkylene group, a (C₃-C₆)alkenylene group, a halo(C₃-C₆)alkenylene group, a (C₃-C₆)alkynylene group or a halo(C₃-C₆)alkynylene group, R⁸

is a hydrogen atom; a halogen atom; a cyano group; a nitro group; a (C₃-C₆)cycloalkyl group; a halo (C₃-C₆)cycloalkyl group; a (C₁-C₆)alkoxycarbonyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; or -A⁴-R¹² (wherein A⁴ is -O-, -S-, -SO-, -SO₂-, -N(R¹¹)- (wherein R¹¹ is as defined above), -C(=O)-, or -C(=N-OR¹³) (wherein R¹³ is a hydrogen atom, a (C₁-C₆)alkyl group, a halo(C₁-C₆)alkyl group, a (C₃-C₆)alkenyl group, a halo(C₃-C₆)alkenyl group, a (C₃-C₆)alkynyl group, a halo (C₃-C₆)alkynyl group, a (C₃-C₆)cycloalkyl group, a phenyl (C₁-C₄)alkyl group, or a substituted phenyl (C₁-C₄)alkyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups),

(i) in the case of A⁴ being -O-, -S-, -SO-, -SO₂- or -N(R¹¹)- (wherein R¹¹ is as defined above), R¹² is a hydrogen atom; a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₃-C₆)alkenyl group; a halo (C₃-C₆)alkenyl group; a (C₃-C₆)alkynyl group; a halo(C₃-C₆)alkynyl group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a (C₁-C₆)alkylcarbonyl group; a halo (C₁-C₆)alkylcarbonyl group; a (C₁-C₆)alkoxycarbonyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyl (C₁-C₄)alkyl group; a substituted phenyl(C₁-C₄)alkyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; (ii) in the case of A⁴ being -C(=O)- or -C(=NOR¹³) (wherein R¹³ is as defined above), R¹² is a hydrogen atom; a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₂-C₆)alkenyl group; a halo(C₂-C₆)alkenyl group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a (C₁-C₆)alkoxy group; a halo (C₁-C₆)alkoxy group; a (C₁-C₆)alkylthio group; a halo(C₁-C₆)alkylthio group; a mono (C₁-C₆)alkylamino group; a di (C₁-C₆)alkylamino group whose (C₁-C₆)alkyl groups may be the same or different; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups;

a phenylamino group; a substituted phenylamino group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyloxy group; a substituted phenyloxy group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenylthio group; a substituted phenylthio group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; or a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups)),

further, R² being able to bind to A¹ or R¹ to form a 5- to 8-membered ring that may contain one to three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, each of Q¹ through Q⁵ is a carbon atom or a nitrogen atom, each of Xs, which may be the same or different, is a halogen atom; a cyano group; a nitro group; a (C₃-C₆) cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a (C₁-C₆)alkoxycarbonyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; or -A⁵-R¹⁴ (wherein A⁵ is -O-, -S-, -SO-, -SO₂-, -C(=O)-, -C(=NOR¹³) (wherein R¹³ is as defined above), a (C₁-C₆)alkylene group, a halo(C₁-C₆)alkylene group, a (C₂-C₆)alkenylene group, a halo(C₂-C₆)alkenylene group, a (C₂-C₆)alkynylene group or a halo(C₃-C₆)alkynylene group,

(1) in the case of A⁵ being -O-, -S-, -SO- or -SO₂-, R¹⁴ is a halo(C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkenyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups

whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; or -A⁶-R¹⁵ (wherein A⁶ is a (C₁-C₆)alkylene group, a halo(C₁-C₆)alkylene group, a (C₃-C₆)alkenylene group, a halo(C₃-C₆)alkenylene group, a (C₃-C₆)alkynylene group or a halo(C₃-C₆)alkynylene group, and R¹⁵ is a hydrogen atom; a halogen atom; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a (C₁-C₆)alkoxycarbonyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; or -A⁷-R¹⁶ (wherein A⁷ is -O-, -S-, -SO- or -SO₂-, and R¹⁶ is a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₃-C₆)alkenyl group; a halo(C₃-C₆)alkenyl group; a (C₃-C₆)alkynyl group; a halo(C₃-C₆)alkynyl group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; or a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups).

(2) in the case of A⁵ being -C(=O)- or -C(=NOR¹³)- (wherein R¹³ is as defined above), R¹⁴ is a (C₁-C₆)alkyl group; a halo (C₁-C₆)alkyl group; a (C₂-C₆)alkenyl group; a halo(C₂-C₆)alkenyl group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a (C₁-C₆)alkoxy group; a (C₁-C₆)alkylthio group; a mono (C₁-C₆)alkylamino group; a di(C₁-C₆)alkylamino group whose (C₁-C₆)alkyl groups may be the same or different; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenylamino group; a substituted phenylamino group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups,

(3) in the case of A⁵ being a (C₁-C₆)alkylene group, a halo(C₁-C₆)alkylene group, a (C₂-C₆)alkenylene group, a halo(C₂-C₆)alkenylene group, a (C₂-C₆)alkynylene group or a halo(C₃-C₆)alkynylene group, R¹⁴ is a hydrogen atom; a halogen atom; a (C₃-C₆)cycloalkyl group; a halo (C₃-C₆)cycloalkyl group; a (C₁-C₆)alkoxycarbonyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups,

halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; or -A⁸-R¹⁷ (wherein A⁸ is -O-, -S-, -SO- or -SO₂-, and R¹⁷ is a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; or -A⁹-R¹⁸ (wherein A⁹ is a (C₁-C₆)alkylene group, a halo(C₁-C₆)alkylene group, a (C₂-C₆)alkenylene group, a halo(C₂-C₆)alkenylene group, a (C₂-C₆)alkynylene group or a halo(C₃-C₆)alkynylene group, and R¹⁸ is a hydrogen atom; a halogen atom; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a (C₁-C₆)alkoxy group; a halo (C₁-C₆)alkoxy group; a (C₁-C₆)alkylthio group; a halo(C₁-C₆)alkylthio group; a (C₁-C₆)alkylsulfinyl group; a halo(C₁-C₆)alkylsulfinyl group; a (C₁-C₆)alkylsulfonyl group; a halo (C₁-C₆)alkylsulfonyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyloxy group; a substituted phenyloxy group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenylthio group; a substituted phenylthio group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; or a heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups)), n is an integer of 0 to 4,

further, two adjacent Xs on the aromatic ring being able to be taken together to represent a fused ring that may have one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups,

each of Ys, which may be the same or different, is a halogen atom; a cyano group; a nitro group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups,

(C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; or -A⁵-R¹⁴ (wherein A⁵ and R¹⁴ are as defined above),

further, two adjacent Ys on the aromatic ring being able to be taken together to represent a fused ring that may have one or more substituents which may be the same or different and are selected from halogen atoms; (C₁-C₆)alkyl groups; halo(C₁-C₆)alkyl groups; (C₁-C₆)alkoxy groups; halo(C₁-C₆)alkoxy groups; (C₁-C₆)alkylthio groups; halo(C₁-C₆)alkylthio groups; (C₁-C₆)alkylsulfinyl groups; halo (C₁-C₆)alkylsulfinyl groups; (C₁-C₆)alkylsulfonyl groups; halo(C₁-C₆)alkylsulfonyl groups; phenyl group; substituted phenyl groups having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; heterocyclic groups; and substituted heterocyclic groups having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups, m is an integer of 1 to 5, and each of Z¹ and Z² is an oxygen atom or a sulfur atom) or a salt thereof.

2. An aromatic diamide derivative or a salt thereof according to claim 1, wherein A¹ is a (C₁-C₈)alkylene group; a substituted (C₁-C₈)alkylene group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, (C₁-C₆)alkylthio (C₁-C₆)alkyl groups, (C₁-C₆)alkoxycarbonyl groups and phenyl group; a (C₃-C₈)alkenylene group; a substituted (C₃-C₈)alkenylene group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, (C₁-C₆)alkylthio (C₁-C₆)alkyl groups, (C₁-C₆)alkoxycarbonyl groups and phenyl group; a (C₃-C₈)alkynylene group; or a substituted (C₃-C₈)alkynylene group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, (C₁-C₆)alkylthio(C₁-C₆)alkyl groups, (C₁-C₆)alkoxycarbonyl groups and phenyl group,

any of the saturated carbon atoms in the above-mentioned (C₁-C₈)alkylene group, substituted (C₁-C₈)alkylene group, (C₃-C₈)alkenylene group, substituted (C₃-C₈)alkenylene group, (C₃-C₈)alkynylene group or substituted (C₃-C₈)alkynylene group being able to have a (C₂-C₅)alkylene group bonded thereto as a substituent, to form a (C₃-C₆)cycloalkane ring, and any two of the carbon atoms in the above-mentioned (C₁-C₈)alkylene group, substituted (C₁-C₈)alkylene group, (C₃-C₈)alkenylene group and substituted (C₃-C₈)alkenylene group being able to form a (C₃-C₆)cycloalkane ring or a (C₃-C₆)cycloalkene ring together with an alkylene group or an alkenylene group,

B is -O- or -N(R⁴)- (wherein R⁴ is a hydrogen atom; a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₃-C₆)alkenyl group; a halo (C₃-C₆)alkenyl group; a (C₃-C₆)alkynyl group; a (C₃-C₆)cycloalkyl group; a (C₁-C₆)alkylcarbonyl group; a halo(C₁-C₆)alkylcarbonyl group; a (C₁-C₆)alkoxycarbonyl group; a phenylcarbonyl group; a substituted phenylcarbonyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio

groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, and di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different; a phenyl(C₁-C₄)alkoxycarbonyl group; a substituted phenyl(C₁-C₄)alkoxycarbonyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, and di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different; a phenyl(C₁-C₄)alkyl group; or a substituted phenyl(C₁-C₄)alkyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups),

R¹ is a hydrogen atom; a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₁-C₄)alkoxy(C₁-C₄)alkyl group; a (C₁-C₄)alkylthio(C₁-C₄)alkyl group; a (C₂-C₆)alkenyl group; a halo(C₂-C₆)alkenyl group; a (C₃-C₆)alkynyl group; a halo(C₃-C₆)alkynyl group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyl(C₁-C₄)alkyl group; a substituted phenyl(C₁-C₄)alkyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; -P(=W¹) (-OR⁵) (-OR⁶) (wherein W¹ is an oxygen atom or a sulfur atom, and each of R⁵ and R⁶, which may be the same or different, is a hydrogen atom; a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₁-C₄)alkoxy(C₁-C₄)alkyl group; a (C₁-C₄)alkylthio (C₁-C₄)alkyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; or a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring; -C(=W¹)-N(R⁵)(R⁶) (wherein W¹, R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶

to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, and R⁵ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); -C(=W¹)-R⁵ (wherein W¹ and R⁵ areas defined above); -C(=W¹)-W¹-R⁷ (wherein W¹s, which may be the same or different, are as defined above, and R⁷ is a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₁-C₄)alkoxy(C₁-C₄)alkyl group; a (C₁-C₄)alkylthio(C₁-C₄)alkyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyl (C₁-C₄)alkyl group; a substituted phenyl (C₁-C₄)alkyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; or a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups); -SO₂-R⁷ (wherein R⁷ is as defined above); -SO₂-N(R⁵)(R⁶) (wherein R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, and R⁵ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain three or four atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); -N(R⁵)(R⁶) (wherein R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, and R⁵ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); or -N=C(R⁵)R⁶ (wherein R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); in the case of B being -N(R⁴)- (wherein R⁴ is as defined above), R¹ being able to be -OR⁵ (wherein R⁵ is as defined above), -C(W²)-N(R⁵)R⁶ (wherein W² is =CH-NO₂, =N-NO₂ or =N-CN, and R⁵ and R⁶ are as defined above, R⁵ or R⁶ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring) or -C(W²)-W¹-R⁷ (wherein W¹, W² and R⁷ are as defined above, R⁷ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring), and R¹ being able to bind to A¹ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, each of R² and R³, which may be the same or different, is a hydrogen atom or a (C₁-C₃)alkyl group, each of Q¹ through Q⁵ is a carbon atom or a nitrogen atom, each of Xs, which may be the same or different, is a halogen atom, a nitro group, a (C₁-C₆)alkyl group, a halo(C₁-C₆)alkyl group, a (C₂-C₆)alkenyl group, a halo (C₂-C₆)alkenyl group, a (C₂-C₆)alkynyl group, a halo(C₂-C₆)alkynyl group, a (C₁-C₆)alkoxy group, a halo (C₁-C₆)alkoxy group, a (C₁-C₆)alkylthio group, a halo(C₁-C₆)alkylthio group, a (C₁-C₆)alkylsulfinyl group, a halo (C₁-C₆)alkylsulfinyl group, a (C₁-C₆)alkylsulfonyl group or a halo(C₁-C₆)alkylsulfonyl group, two adjacent Xs on the aromatic ring being able to be taken together to represent a fused ring that may have one or more substituents which may be the same or different and are selected from halogen atoms, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl

groups, (C₁-C₆)alkylsulfonyl groups and halo(C₁-C₆)alkylsulfonyl groups, n is an integer of 0 to 2, each of Ys, which may be the same or different, is a halogen atom; a cyano group; a nitro group; a (C₃-C₆) cycloalkyl group; a halo (C₃-C₆)cycloalkyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkyl-sulfonyl groups, mono(C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkyl-sulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; or -A⁵-R¹⁴ (wherein A⁵ and R¹⁴ are as defined above),

two adjacent Ys on the aromatic ring being able to be taken together to represent a fused ring that may have one or more substituents which may be the same or different and are selected from halogen atoms; (C₁-C₆) alkyl groups; halo(C₁-C₆)alkyl groups; (C₁-C₆)alkoxy groups; halo (C₁-C₆)alkoxy groups; (C₁-C₆)alkyl-thio groups; halo(C₁-C₆)alkylthio groups; (C₁-C₆)alkyl-sulfinyl groups; halo(C₁-C₆)alkylsulfinyl groups; (C₁-C₆) alkylsulfonyl groups; halo (C₁-C₆)alkylsulfonyl groups; phenyl group; substituted phenyl groups having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkyl-thio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkyl-sulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; heterocyclic groups; and substituted heterocyclic groups having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkyl-thio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkyl-sulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups, m is an integer of 1 to 5, and each of Z¹ and Z² is an oxygen atom or a sulfur atom.

3. An aromatic diamide derivative or a salt thereof according to claim 2, wherein A¹ is a (C₁-C₈)alkylene group; a substituted (C₁-C₈)alkylene group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkyl-thio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkyl-sulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, (C₁-C₆)alkylthio (C₁-C₆) alkyl groups, (C₁-C₆)alkoxycarbonyl groups and phenyl group; a (C₃-C₈)alkenylene group; a substituted (C₃-C₈) alkenylene group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, halo (C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, (C₁-C₆)alkyl-thio(C₁-C₆)alkyl groups, (C₁-C₆)alkoxycarbonyl groups and phenyl group; a (C₃-C₈)alkynylene group; or a substituted (C₃-C₈)alkynylene group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkylsulfonyl groups, (C₁-C₆)alkyl-thio(C₁-C₆)alkyl groups, (C₁-C₆)alkoxycarbonyl groups and phenyl group,

any of the saturated carbon atoms in the above-mentioned (C₁-C₈)alkylene group, substituted (C₁-C₈)alkylene group, (C₃-C₈)alkenylene group, substituted (C₃-C₈)alkenylene group, (C₃-C₈)alkynylene group or substituted (C₃-C₈)alkynylene group being able to have a (C₂-C₅)alkylene group bonded thereto as a substituent, to form a (C₃-C₆)cycloalkane ring, and any two of the carbon atoms in the above-mentioned (C₁-C₈)alkylene group, substituted (C₁-C₈)alkylene group, (C₃-C₈)alkenylene group and substituted (C₃-C₈)alkenylene group being able to form a (C₃-C₆)cycloalkane ring or a (C₃-C₆)cycloalkene ring together with an alkylene group or an alkenylene group,

B is -O- or -N(R⁴)- (wherein R⁴ is a hydrogen atom; a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₃-C₆)

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(C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkyl-sulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); -C(=W¹)-N(R⁵)(R⁶) (wherein W¹, R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, and R⁵ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); -C(=W¹)-R⁵ (wherein W¹ and R⁵ are defined above); -C(=W¹)-W¹-R⁷ (wherein W¹s, which may be the same or different, are as defined above, and R⁷ is a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₁-C₄)alkoxy(C₁-C₄)alkyl group; a (C₁-C₄)alkylthio(C₁-C₄)alkyl group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, mono(C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a phenyl(C₁-C₄)alkyl group; a substituted phenyl(C₁-C₄)alkyl group having on the ring one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkyl-sulfonyl groups, mono (C₁-C₆)alkylamino groups, di (C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups; a heterocyclic group; or a substituted heterocyclic group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo (C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo (C₁-C₆)alkyl-sulfonyl groups, mono (C₁-C₆)alkylamino groups, di(C₁-C₆)alkylamino groups whose (C₁-C₆)alkyl groups may be the same or different, and (C₁-C₆)alkoxycarbonyl groups); -SO₂-R⁷ (wherein R⁷ is as defined above); -SO₂-MR⁵(R⁶) (wherein R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, and R⁵ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain three or four atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); -N(R⁵)(R⁶) (wherein R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring, and R⁵ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); or -N=C(R⁵)R⁶ (wherein R⁵ and R⁶ are as defined above, R⁵ being able to bind to R⁶ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring); in the case of B being -N(R⁴)- (wherein R⁴ is as defined above), R¹ being able to be -OR⁵ (wherein R⁵ is as defined above), -C(W²)-N(R⁵)R⁶ (wherein W² is =CH-NO₂, =N-NO₂ or =N-CN, and R⁵ and R⁶ are as defined above, R⁵ or R⁶ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring) or -C(W²)-W¹-R⁷ (wherein W¹, W² and R⁷ are as defined above, R⁷ being able to bind to R⁴ to form a 5- to 8-membered ring that may contain two or three atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring), and R¹ being able to bind to A¹ to form a 5- to 8-membered ring that may contain one or two atoms which may be the same or different and are selected from oxygen atom, sulfur atom and nitrogen atom, between adjacent carbon atoms constituting the ring,

each of R² and R³, which may be the same or different, is a hydrogen atom or a (C₁-C₃)alkyl group, each of Q¹ through Q⁴ is a carbon atom, each of Xs, which may be the same or different, is a halogen atom, a nitro group, a (C₁-C₆)alkyl group, a halo(C₁-C₆)alkyl group, a (C₂-C₆)alkenyl group, a halo (C₂-C₆)alkenyl group, a (C₂-C₆)alkynyl group, a halo(C₂-C₆)alkynyl group, a (C₁-C₆)alkoxy group, a halo(C₁-C₆)alkoxy group, a

(C₁-C₆)alkylthio group, a halo(C₁-C₆)alkylthio group, a (C₁-C₆)alkylsulfinyl group, a halo (C₁-C₆)alkylsulfinyl group, a (C₁-C₆)alkylsulfonyl group or a halo(C₁-C₆)alkylsulfonyl group,

two adjacent Xs on the aromatic ring being able to be taken together to represent a fused ring that may have one or more substituents which may be the same or different and are selected from halogen atoms, nitro group, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo (C₁-C₆) alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆) alkylthio groups, (C₁-C₆) alkylsulfinyl groups, halo (C₁-C₆) alkylsulfinyl groups, (C₁-C₆) alkylsulfonyl groups and halo (C₁-C₆) alkylsulfonyl groups, n is an integer of 0 to 2,

Q⁵ is a carbon atom or a nitrogen atom, each of Ys, which may be the same or different, is a halogen atom; a (C₁-C₆)alkyl group; a halo(C₁-C₆)alkyl group; a (C₃-C₆)cycloalkyl group; a halo(C₃-C₆)cycloalkyl group; a (C₁-C₆)alkoxy group; a halo (C₁-C₆)alkoxy group; a (C₁-C₆)alkylthio group; a halo(C₁-C₆)alkylthio group; a (C₁-C₆)alkylsulfinyl group; a halo (C₁-C₆)alkylsulfinyl group; a (C₁-C₆)alkylsulfonyl group; a halo (C₁-C₆)alkylsulfonyl group; a halo(C₁-C₆)alkoxyhalo (C₁-C₆)alkoxy group; a phenyl group; a substituted phenyl group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, halo (C₁-C₆)alkyl groups, halo (C₁-C₆)alkoxy groups, halo (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylsulfinyl groups and halo(C₁-C₆)alkylsulfonyl groups; a phenyloxy group; a substituted phenyloxy group having one or more substituents which may be the same or different and are selected from halogen atoms, cyano group, halo(C₁-C₆)alkyl groups, halo(C₁-C₆)alkoxy groups, halo(C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylsulfinyl groups and halo (C₁-C₆)alkylsulfonyl groups,

two adjacent Ys on the aromatic ring being able to be taken together to represent a fused ring that may have one or more substituents which may be the same or different and are selected from halogen atoms, (C₁-C₆)alkyl groups, halo(C₁-C₆)alkyl groups, (C₁-C₆)alkoxy groups, halo(C₁-C₆)alkoxy groups, (C₁-C₆)alkylthio groups, halo (C₁-C₆)alkylthio groups, (C₁-C₆)alkylsulfinyl groups, halo(C₁-C₆)alkylsulfinyl groups, (C₁-C₆)alkylsulfonyl groups, halo(C₁-C₆)alkylsulfonyl groups, phenyl group, and substituted phenyl groups having one or more substituents which may be the same or different and are selected from halogen atoms, halo (C₁-C₆)alkyl groups, halo(C₁-C₆)alkoxy groups, halo(C₁-C₆)alkylthio groups, halo(C₁-C₆)alkylsulfinyl groups and halo(C₁-C₆)alkylsulfonyl groups, m is an integer of 1 to 3, and each of Z¹ and Z² is an oxygen atom.

4. An agricultural and horticultural chemical comprising an aromatic diamide derivative or a salt thereof according to any one of claims 1 to 3 as an active ingredient.
5. An agricultural and horticultural chemical according to claim 4, which is an agricultural and horticultural insecticide.
6. A method for applying an agricultural and horticultural chemical, **characterized by** applying an agricultural and horticultural chemical according to claim 4 to a crop to be protected or the growth environment of the crop to be protected, in an effective dosage for protecting useful crops against insect pests.
7. A method for applying an agricultural and horticultural chemical according to claim 5 which is an agricultural and horticultural insecticide.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP00/09146

A. CLASSIFICATION OF SUBJECT MATTER Int.Cl. ⁷ C07C233/69, 233/75, 233/78, 271/12, 271/20, 271/28, 275/14, 311/05, 317/28, 323/12, 323/42, 323/43, 335/08, C07D211/58, 213/30, 213/61, 239/28, 241/24, 285/12, 307/82, 309/04, 317/28, 317/46, 319/20, C07F9/165, 9/24, 9/58, A01N47/12, 47/16, 47/24 According to International Patent Classification (IPC) or to both national classification and IPC								
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) Int.Cl. ⁷ C07C233/69, 233/75, 233/78, 271/12, 271/20, 271/28, 275/14, 311/05, 317/28, 323/12, 323/42, 323/43, 335/08, C07D211/58, 213/30, 213/61, 239/28, 241/24, 285/12, 307/82, 309/04, 317/28, 317/46, 319/20, C07F9/165, 9/24, 9/58, A01N47/12, 47/16, 47/24 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)								
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td> EP, 919542, A2 (NIHON NOHYAKU CO., LTD.), 02 June, 1999 (02.06.99), Claims; Table 1 (for example, page 71, No.981 etc.) & CZ, 9803799, A3 & AU, 9893292, A & ZA, 9810677, A & HU, 9802725, A2 & CN, 1222506, A & JP, 11-240857, A & BR, 9805060, A & KR, 99045504, A </td> <td>1-7</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	EP, 919542, A2 (NIHON NOHYAKU CO., LTD.), 02 June, 1999 (02.06.99), Claims; Table 1 (for example, page 71, No.981 etc.) & CZ, 9803799, A3 & AU, 9893292, A & ZA, 9810677, A & HU, 9802725, A2 & CN, 1222506, A & JP, 11-240857, A & BR, 9805060, A & KR, 99045504, A	1-7
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Date of the actual completion of the international search 31 January, 2001 (31.01.01)		Date of mailing of the international search report 13 February, 2001 (13.02.01)						
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